Environment and Social Management Framework (ESMF)

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Maharashtra Resilience Development Project (MRDP)

Maharashtra Institution for Transformation

Executive Summary

The Maharashtra Resilience Development Project (MRDP), initiated by the Government of Maharashtra with support from the World Bank, is a strategic initiative aimed at enhancing disaster resilience and climate adaptation capacity across the State. To ensure that all sub-projects under MRDP are socially inclusive, environmentally sustainable, and legally compliant, an Environmental and Social Management Framework (ESMF) has been developed. This framework aligns with both the National and State regulations, as well as the World Bank's Environmental and Social Framework (ESF), and serves as a comprehensive guide for managing E&S risks throughout the project lifecycle.

The ESMF outlines a systematic approach for identifying, assessing, managing, and monitoring potential environmental and social impacts associated with MRDP activities. It promotes risk-informed decision-making and integrates safeguard measures into every phase of project planning and implementation. The primary objectives of the ESMF are to define procedures for environmental and social screening and categorization of sub-projects, establish methodologies for conducting Environmental and Social Impact Assessments (ESIAs) and preparing Environmental and Social Management Plans (ESMPs), ensure institutional accountability and capacity for safeguard implementation, and enable consistent application of mitigation, monitoring, and reporting systems.

The MRDP encompasses a wide range of activities designed to build resilience across sectors. These include the identification and prioritization of vulnerable regions and communities, preparation of climate-resilient infrastructure designs, retrofitting and upgrading of existing public assets, construction of new facilities such as flood shelters and resilient housing, strengthening of early warning systems, and development of emergency response mechanisms. Additional activities involve capacity-building programs for local institutions, training workshops for government officials and community stakeholders, deployment of digital tools for risk mapping and monitoring, and implementation of nature-based solutions to enhance ecological resilience.

The components of MRDP :

Components of MRDP are:

Component 1: Climate-Informed Flood Risk Management

Enhancing Reservoir Operations and Flood Forecasting which comprises of interventions for moderating the flood peaks and enhancing the discharge carrying capacity of the river;

Component 2: Multi-Hazard Resilience in Districts and Cities comprising of protection of Sangli, Kolhapur and Ichalkaranji cities from urban flooding and protection of landslide prone sites;

Component 3: Enhanced Emergency Management Capacities by way of upgrading the City EOCs and Strengthening Early Warning and Risk Communication;

Component 4: Private Capital Mobilization for Risk Financing;

Component 5: will focus on Implementation Support and Knowledge Management

Project Beneficiaries

The Project is expected to benefit approximately 120 million people in the State.

Environmental & Social Considerations

The findings of the ESMF highlight several key environmental and social considerations that must be addressed during project implementation. The framework based on the baseline data, identifies risks such as habitat disruption, pollution from construction activities, and resource depletion, particularly in ecologically sensitive zones. Socially, the ESMF notes potential challenges related to land acquisition, impacts on vulnerable populations, labour \management, and community health and safety. It emphasizes the importance of inclusive stakeholder engagement, equitable benefit-sharing, and culturally sensitive planning. The project proponents are well aware that while MRDP has the potential, to deliver significant resilience benefits, its success depends on proactive risk mitigation, institutional coordination, and continuous monitoring of safeguard compliance. Keeping in mind this aspect this environmental and social framework is designed.

Legal Framework

ESMF takes the overview of all relevant International, National, State legal instruments and the World Bank's Environmental & Social Standards and defines the applicability of these instruments in context of MRDP. After the comparative study, of the provisions in National / State laws and that in the World Bank's Environmental & Social Standards (ESS 1 to 10), gaps are identified and the remedial measures to fill these gaps are proposed. **In case of gaps, amongst the requirements of Laws and World Bank guidelines, more stringent requirement will prevail.**

ESS 7 of the world bank is triggered when the indigenous people have " collective attachment" to the land. In Indian context, ESS7 is applicable, to those areas which are included in Schedule V, of the Constitution of India. Sangli and Kolhapur districts (Project area) are not included, in Schedule V, designated under Article 244(1), of the Constitution of India. As such, Panchayat Extension of Scheduled Area (PESA) Act, 1996, enacted to respect and preserve the traditional tribes governance and customs is also not applicable to these districts. Thus, full Indigenous People Policy Framework (IPPF) is not applicable to MRDP. However, MRDP is committed to recognise scheduled tribe families, living at scattered locations, in the project area, as vulnerable households and to give special assistance to such households.

Risk categorization approach

Sub-project specific, Environmental and Social (E&S) risks and SEA/ SH risks have been assessed, following a systematic process that begins with preliminary screening, of the sub-project, location and regulatory triggers using a standard template, followed by identification of key Environmental and Social risks such as Pollution, Biodiversity impact, Land Acquisition, Labour issues, Community health and Safety, Cultural Heritage concerns etc. These risks are then evaluated based on their nature, scale, magnitude, duration, reversibility and borrower's institutional capacity to manage them and assigning appropriate weight / score for each of the risk parameter depending on the nature of its severity.

Overview of E&S and SEA/ SH risk categorization

- Sub-project involving civil works related to Radhanagari dam has substantial E&S risk and SEA/ SH risks.
- Civil works related to river training works, new water storage works, landslide mitigation works, urban storm water works has Substantial E&S and SEA / SH risks.

- Civil works related to maintenance of existing water storage structures in free catchment has moderate E&S and SEA/ SH risks.
- Digital intervention based sub-projects / capacity building sub-projects / feasibility studies have low E&S and SEA/ SH risks.

Only, sub-project component that lies within 10 km radius from Radhanagari Wildlife Sanctuary is "Construction of additional Spillway to existing Radhanagari dam". However, it does not involve any acquisition of private land or displacement or diversion of any forest land. In this particular case, there is a submergence of dam, between Wildlife Sanctuary boundary and the work site. Hence, no wildlife corridors will be affected due to the implementation of the sub-project. The workspace is in the possession of the Water Resources Department. However, prior permission under the Wildlife (Protection) Act 1972 will be taken. MRDP is committed to prepare the Biodiversity Management Plan (BMP) and the same shall be implemented, by including it in the bid document, to minimize ecological disturbances, while wildlife and habitat protection measures will include restrictions on night-time construction to avoid disrupting nocturnal species. Implementation of BMP shall be monitored by the PIU & PMTC.

Radhanagari dam has been instrumental, to socio-economic development of the region, since 1954. Further, dam also significantly benefits biodiversity and the environment by supporting a rich ecosystem and sustaining the surrounding wildlife century, contributing to the conservation of flora, fauna and ecological processes in the region. In fact, Radhanagari wildlife century has been developed on the fringe of the reservoir. **The proposed sub-project is inevitable, for ensuring the safety of the dam, mitigating flood risks and sustenance of the rich biodiversity developed on the fringe of water and socio-economic benefits, generated by the dam, in last 70+ years,**

The proposal for the Wildlife clearance is already initiated and Chief Conservator of Forests (Wildlife) Mumbai has recommended the proposal, as there is no diversion of forest land.

Safeguard instruments for management of the risks

Based on the E&S risk category and ESS triggers, following sub-project specific safeguard instruments are proposed.

Risk Category	Safeguard Instruments
High Risk	• Full ESIA, Detailed ESMP; Stakeholder Engagement Plan (SEP); • And other applicable instruments such as Resettlement Action Plan (RAP), Biodiversity Management Plan (BMP), Cultural Heritage Plan (CHP), Labour Management Procedures (LMP), • Independent monitoring.
Substantial Risk	• ESIA (customised), ESMP, RAP/ ARAP (where land impacts are triggered), LMP and SEP; • Strengthened supervision.
Moderate Risk	• Simplified ESMP covering impact identification and mitigation matrix based on standard Environmental code of practice addressing predictable and site-specific impacts, SEP- less intensive than substantial / high risk.
Low Risk	• Screening note or E&S checklist and ESMP based on Standard Operating Procedures, project specific good practice, ESMP covering Waste Management Plan (WMP), OHS plan, dust and noise control, etc., Labour management good practices (simplified covering workers safety and PPE, code of conduct, GRM for

Risk Category	Safeguard Instruments
	workers), SEP with simple disclosure of information and routine supervision checklist.

Safeguard instruments will be disclosed as required, integrated with contract documents, implemented and monitored throughout the project life cycle, with provision of updating safeguard instrument if the risk level changes.

Institutional Arrangements & Staffing

Institutional roles and responsibilities for implementing the ESMF are clearly defined. The Project Management Unit (PMU), located within MITRA, will be responsible for overall coordination and monitoring of safeguard activities. Project Implementation Units (PIUs), supported by dedicated E&S cell, comprising of senior level environmental, social, biodiversity, land acquisition and resettlement, community consultation specialists and nodal grievance officer. Specialists will handle sub-project level planning, supervision, and reporting. Besides this adequate E&S staff is also proposed at all PIUs. In ESMF, recruitment timelines, roles and responsibilities of E&S staff are clearly defined. All these E&S specialists will be there throughout the project implementation period. **Budget provision made for E&S staffing is INR 336 Million.**

Training & Capacity Building

PMU is committed to organise training and capacity building programs, for the E&S staff, throughout the project implementation. Dedicated provision of INR 36.64 Million is provided for capacity building.

Stakeholder Engagements

Stakeholder engagement and public disclosure are emphasized in all phases of the Project. The framework mandates continuous consultation with affected communities, inclusion of vulnerable and marginalized groups, and regular disclosure of safeguard instruments, both in English and Marathi. These measures are designed to ensure transparency, social accountability, and informed participation in the project. **Dedicated budget provision of INR 4.2 Million is made for community engagements.**

Key feedback received, during stakeholder consultations have been appropriately addressed in project design / formulation.

Project Component	Key Feedback / suggestions Received	How Addressed
Component 1: Radhanagari Dam	Existing automatic gates of Radhanagari dam have cultural heritage and hence they need to be preserved by proper maintenance.	**Accepted.** Earlier it was planned to replace automatic gates by new radial gates but considering the sentiments of the people, it has now been decided to keep the automatic gates intact with maintenance and provide additional spillway at adjacent location.
Component 1: River Works	Restoration of paleo channels and natural drainage system which will moderate the flood severity.	**Accepted.** Effectiveness of proposed interventions is being confirmed, on mathematical model and

Project Component	Key Feedback / suggestions Received	How Addressed
		after that it will be included in river interventions.
Component 1: Water conservation works in free catchment	Water conservation works needs to be implemented in free catchment, for moderation of flood.	**Accepted.** The bids for survey investigation and preparation of DPR for the desilting of existing water storage structures and construction of new water storage structures in the free catchment are called.
Component 2: Urban Stormwater drainage systems in 3 municipal corporations	Catchment upstream of Kalamba tank needs to be treated for flood moderation.	**Accepted.** Necessary provisions have been made in the DPR for construction of Storm Water Drainage system of Kolhapur.
	Outlets of Rankala tank in Kolhapur city needs to be made operative.	
	The existing capacity of culverts in the storm water drainage system is inadequate which is causing stagnation of water resulting into mosquito borne diseases.	
	The impacted people are not ready for displacement	Alignment, of stormwater system is so finalised that it does not require any land acquisition or displacement.

Grievance Redressal Mechanism (GRM)

ESMF mandates structured Grievance Redress Mechanism (GRM) to address the concerns raised, by project-affected persons. Grievance redress committees will be established at various levels, with clear procedures for documentation, resolution, and escalation of complaints. This mechanism is intended to provide timely and effective responses to environmental and social issues.

Monitoring & Reporting

Finally, the ESMF includes a robust monitoring and evaluation system. This system features measurable indicators, periodic audits, and third-party verification to assess environmental and social performance throughout the duration of the project.

Integration of ESMP with bid documents

ESMP will be integrated with the implementation contracts. It will be the primary responsibility of the contractor to implement the ESMP. Cost of implementation of ESMP will be considered in the cost estimate and the contractor will be asked to quote its rates, considering the E&S obligations, provided in ESMP.

PIU will monitor the day-to-day implementation of the ESMP, by the contractor. Necessary clauses, enabling penal actions, against contractors who fails to implement E&S safeguard measures will be proposed in the bid document.

ESMF Budget

Budget provisions proposed are INR 425 Million (1.33 % of the total MRDP estimated cost of INR 32,000 Million). During the implementation, budget provisions will be revived and revised as per the necessity.

In conclusion, this ESMF document, adopted for MRDP will serve as a comprehensive governance tool that ensures environmental and social considerations are embedded in infrastructure planning and execution. It reflects the Government of Maharashtra's commitment to sustainable development and strengthens institutional systems that promote resilience, inclusiveness, and long-term environmental stewardship.

Table of Content

LIST OF FIGURES

LIST OF TABLES

1 PROJECT OVERVIEW

1.1 Project Rationale/Background

India, one of the most climate-vulnerable countries in the world, has experienced an increasing frequency of extreme weather events over the past few decades. The country's diverse geography and large river systems make it highly susceptible to floods, droughts, cyclones, and landslides.

During the past 50 years, the State has experienced a seven-fold increase in the frequency of drought and a six-fold increase in the frequency of flood events. The situation has been further exacerbated due to climate change phenomenon. **Indian Meteorological Department (IMD) have observed that due to Climate Change effect, since 2000, frequency of Tropical Cyclonic Storms on Arabian Sea has increased by about 52%[1].** Cyclonic storms, in effect, have also increased the Flood Size in the State. The State has faced recurring flood events in 2005, 2006, 2019 and 2021. The 2019 flood event was the severest of them which lingered for more than a week.

Significant areas of Satara, Sangli and Kolhapur districts of western Maharashtra along the river Krishna and its tributaries are recurrently and chronically affected by the floods. During the 2019 flood event, about 332 sq. km. of area in the Kolhapur district and 207 sq. km. of area in the Sangli district were inundated. About 2260 villages were severely affected. Monetary compensation required to be given to the flood affected persons during 2019-20 and 2020-21 were INR 641 crore and 336 crores respectively. Additionally, the expenditure incurred on restoration of flood damaged public infrastructure was nearly INR 800 crore. A substantial portion of the developmental budget was required to be reappropriated to meet these unforeseen expenses.

As observed by the Expert Study committee, constituted by Government of Maharashtra, Sangli and Kolhapur districts, due to their peculiar topographic features are worst hit during the floods. During 2019 flood event, 215 villages of Kolhapur district and 58 villages of Sangli district were affected. The inundated areas in Kolhapur and Sangli district was 1567 square kilometres and 692 square kilometres.

Additionally, Maharashtra faces a multi-hazard risk scenario, where extreme weather events often occur simultaneously across different districts. The challenge is compounded by the absence of a robust risk-informed decision-making system, lack of disaster risk mainstreaming, limited institutional capacity, and an inadequate emergency response framework. As climate change accelerates, the State requires a comprehensive resilience program to mitigate these risks and safeguard lives, livelihoods, and assets. Addressing these challenges requires a scientific, data-driven approach to flood and disaster risk management, integrating advanced forecasting systems, climate risk modelling, and coordinated emergency response mechanisms.

The Government of Maharashtra (GoM) recognizes the urgent need for a holistic resilience strategy and has launched the Maharashtra Resilience Development Project (MRDP) to address this crisis. The program aims to enhance resilience across the State of Maharashtra through climate-informed and integrated flood, drought, and landslide risk management. This entails strengthening institutional capacities for adaptive planning, mainstreaming disaster risk reduction, and implementing multi-hazard mitigation strategies. MRDP will focus on establishing a decision-making system based

[1] "A Report on Floods 2019 (Krishna Sub-Basin) May 2020, by Experts Study Committee, constituted by the Government of Maharashtra.

on state-of-art technology for risk management, investment planning, and emergency preparedness, in the Krishna river basins. Additionally, the program will develop risk modelling and climate scenarios, conduct feasibility studies, and prepare Detailed Project Reports (DPRs) for long-term investments in flood and water resource management, ensuring a resilient future for Maharashtra.

1.2 Goals & Objectives of the Project[2]

Overarching objective of the project is:

To Strengthen multi-hazard climate and disaster risk management and institutional capacity for Maharashtra's resilient development.

The implementation progress and success will be measured and monitored via following indicators:

a) People benefitting from climate resilient planning, preparation, surveillance, and/or response
b) People with access to information of improved early warning systems
c) People covered by risk finance and insurance

1.3 Project Formulation

In the aftermath of the critical Flood Event 2019, the state government constituted a Committee of Experts to identify the reasons of flooding and suggest remedial measures thereof. The committee submitted its report in May-2020. The said Committee Report - **"A Report on Floods 2019 (Krishna Sub-Basin) by Experts Study Committee"** is available on WRD Maharashtra web site https://wrd.maharashtra.gov.in.

The primary collective reasons of recurrent floods in the Krishna basin as identified by the said Committee are persistent and simultaneous occurrence of high intensity rainfall of short durations, both in dam catchment, as well as in uncontrolled (free) catchments below the dams. In addition, absence of flood absorption capacity in the reservoir planning of existing dams, typical topographic features of terrain, and existence of series of confluences in short river reaches, river meandering, comparatively flatter lower reaches, large scale encroachment on natural drainage system and reduced discharge carrying capacity of streams and river channels.

The project proponent, with the help of consultants carried out rigorous surveys, hydrological studies and hydrodynamic simulation studies. Based on in-depth studies the set of interventions have been identified. Thus, the project formulation is evidence based, strong and reliable.

1.4 Project Beneficiaries

The Project is expected to benefit approximately 120 million people (of which 48 percent are women) living in the State.[3] The direct beneficiaries include the following groups:

(a) People and business owners living along rivers benefit from flood hazard reduction measures.

(b) Residents of Ichalkaranji, Kolhapur, and Sangli with reduced flood risk exposure due to improved storm water management.

(c) People benefiting from enhanced emergency operations.

[2] PPRID-12090, approved by Government of Maharashtra, Ministry of Jal-Shakti Department of WRD and GR dated 17th October 2023
[3] Government of India. 2011. Census.

(d) Owners and employees of Micro, Small & Medium Enterprises (MSMEs) and households with increased access to insurance and credit products.

1.5 Implementation Area

The Component 1 and 2 (hard interventions) will be implemented in the Sangli and Kolhapur districts which faces flood risk frequently; whereas component 3,4 and 5 (soft interventions) will be implemented throughout the State. Kolhapur lies between 15°43' to 17°17' North latitude and 73°42' to 74°42' East longitude, whereas Sangi lies between 16° to 17° North latitude and 73° to 75° East longitude. A map showing districts of structural interventions under MRDP in the State of Maharashtra is mentioned below.

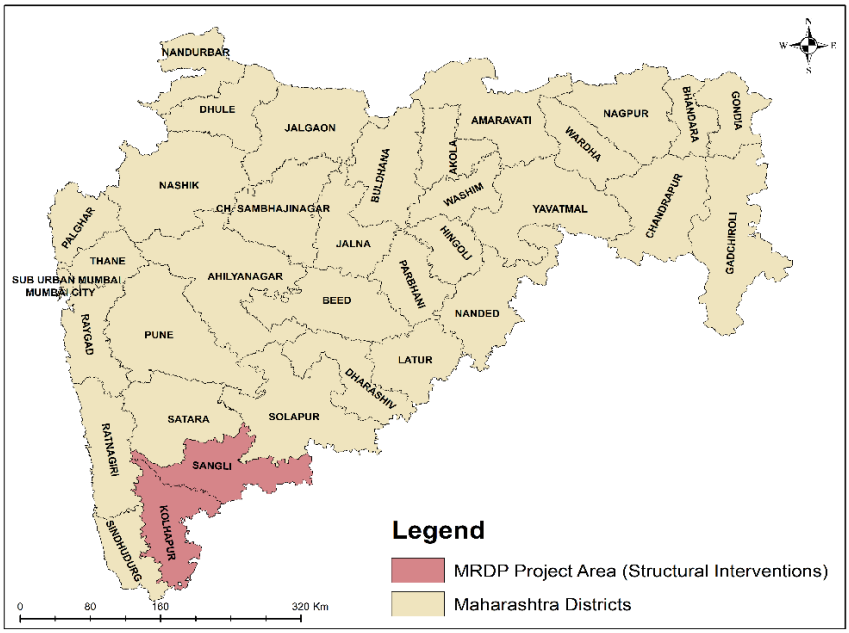

Figure 1: Districts of structural interventions under MRDP

1.6 Project Components

The project seeks to strengthen resilient development in Maharashtra by demonstrating an integrated climate and disaster risk management approach across levels. This includes strengthening overall risk governance and emergency management capacity at State level, flood hazard reduction activities in the upper Krishna River sub-basin, multi-hazard reduction in the downstream cities of Kolhapur, Sangli, and Ichalkaranji, and risk financing to mitigate residual risks at MSME- and household-level. The project is divided into 5 components as describes below-

Component 1: Climate-Informed Flood Risk Management (Total: US$130 million; IBRD: US$91 million; GoM: US$39 million). This component will reduce the fluvial flood risk in the upper-Krishna sub-basin through the following hard and soft interventions:

A. **Enhancing Reservoir Operations and Flood Forecasting** (Total: US$5 million; IBRD: US$3.5 million; GoM: US$1.5 million): Enhancement of climate-informed reservoir operation system (CIROS) including the upgrade of the Real Time Data Acquisition System (RTDAS) and integration with reservoir operation system, Real-Time Stream Forecast (RTSF), and policy reforms for revision of the ROS operation manual towards better and efficient flood risk management. State-of-art digital technology integrating future climate change scenarios will be

piloted in the Krishna basin for future scale-up to other states or other countries. Coordination mechanisms to feed the flood forecast information produced by WRD/MKVDC into the flood early warning issued by the Dept. of R&R will be established.

B. **River Training Works** (Total: US$122 million; IBRD: US$85.4 million; GoM: US$36.6 million): In planning the interventions the approach would be to reduce the flood peaks to the extent possible and then to increase the existing discharge carrying capacity of the river by resorting to minimum disruption approach.

   The interventions will be identified by rigorous survey and hydraulic modelling. The interventions for moderating the flood peaks would be such as:

   (i) Retrofitting of existing sluice gates and provision of additional spillway to the Radhanagari dam will facilitate early depletion of dam in anticipation of approaching floods. This will create a flood cushion in the dam and hence reduce the flood peaks substantially;
   (ii) Restoration paleo channels;
   (iii) Rejuvenation of existing natural drainage systems (nalas) to enhance flood retention capacity and early recession of flood;
   (iv) Nature based solutions;
   (v) Rejuvenation of storage capacity of old storage tanks and construction of detention tanks in free catchment;

The river training works for increasing the existing discharge carrying capacity of the river channels would be such as:

   (i) Restoration of natural cross section of the river by removing man-made interventions;
   (ii) Enlargement of cross sections in selective reaches, wherever it is absolutely necessary;
   (iii) Removing rock outcrops in the river course;
   (iv) Removing redundant structures in the river course;
   (v) Modifying hydraulically inefficient structures such as Sangli K. T. Weir;
   (vi) Installation of sluice gates or inflatable rubber dams at the confluence to prevent the backflow in tributaries;
   (vii) Straightening the river meanders;
   (viii) Construction of levees / flood embankments / flood walls;

C. **Conducting Capacity Development and Feasibility Studies** (Total: US$3 million; IBRD:US$2.1 million; GoM: US$0.9 million): Capacity development of WRD/MKVDC, integrated flood risk management plan and feasibility studies for proposals to moderate extremely high flood intensities and reduce drought risk, expected to increase due to climate change. Technical feasibility studies and capacity development of WRD/MKVDC and related institutes in areas such as flood planning and flood forecasting will also be implemented.

Component 2 Multi-Hazard Resilience in Districts and Cities (Total: US$186 million; IBRD: US$130.2 million; GoM contribution: US$55.8 million). This component will undertake mitigation measures against urban flooding in Sangli-Miraj-Kupwad, Kolhapur and Ichalkaranji municipal corporation jurisdiction and landslide prone sites in ghat areas of Kolhapur district.

A. **Reducing Urban Flood Risk** (Total: US$168 million; IBRD: US$117.6 million; GoM: US$50.4 million): A program of mitigation measures will be developed for Kolhapur, Sangli-Miraj-Kupwad, and Ichalkaranji Municipal Corporation jurisdiction based on climate change-informed flood risk assessments and development of high-resolution flood maps with a focus on blue, green

and grey measures that also offer co- benefits for extreme heat stress and air pollution reduction and the community. This will include upgrading of storm water drainage network, culverts, desilting measures, and nature-based solutions that integrate the cities' parks, lakes, and other multi-use urban spaces. This data- enabled and analyses-based prioritization and design of resilience investments will inform the pilot cities' efforts in risk-informed development planning. A potential future scale-up of similar investments in other cities will be considered based on the demonstration effect in the three target cities of the MRDP.

B. **Reducing Landslide Risk** (Total: US$18 million; IBRD: US$12.6 million; GoM: US$5.4 million): This activity will include landslide risk assessments and a mix of mitigation, monitoring, and early warning related investments in selected landslide hotspots in Kolhapur district. Given the variance across these sites in terms of landslide triggers (e.g., increasingly extreme precipitation due to climate change), severity and size of slides, and exposed elements at risk (residential settlements, pilgrims, infrastructure, and agricultural land), a systematic approach to investment design will be adopted including the development of Landslide Hazard Zonation Maps and Landslide Risk Assessment Maps, developing a catalogue of different treatment measures ranging from engineering, non-engineering measures, and bio-engineering measures / vegetative measures together with an evaluation of design alternatives for each site.

Component 3 Enhanced Emergency Management Capacities (Total: US$43 million; IBRD: US$30.1 million; GoM: US$12.9 million). This component will strengthen multi-level emergency preparedness and response capabilities through the following:

A. **Upgrading District and City EOCs** (Total: US$33 million; IBRD: US$23.1 million; GoM: US$9.9 million): Non-structural upgrade of 36 district and 3 city emergency operation centres with state-of-the-art command and control facilities for improved situational awareness and decision-making in addition to modernization of EOC infrastructure, IT Systems, and investments in resilient communication networks between the different EOCs. An Integrated Emergency Management System (IEMS) will be deployed as a crucial element of the EOC operations to enhance emergency management capacities of a robust Multi-Hazard Impact- Based Early Warning System.

B. **Strengthening Early Warning and Risk Communication** (Total: US$10 million; IBRD: US$7 million; GoM: US$3 million): This will include investments in early warning for multiple hazards amplified by climate change (e.g., lightning, landslides, floods), dissemination (cell broadcasting) and action (community-based capacity building). This sub-component will also include the development of state-wide climate-informed multi-hazard risk assessments using innovative approaches such as earth observation, feeding into the systems developed in the EOCs as an integrated digital platform for resilience-building and resilient development planning.

Component 4: Private Capital Mobilization for Risk Financing (Total: US$19 million; IBRD: US$13.3 million; GoM: US$5.7 million; Commercial Financing: US$800 million). This component will reduce the financial burden of increasingly frequent climate disasters on the state budget by mobilizing private capital for climate-proofing housing stock in disaster-prone areas and increasing the financial resilience of homeowners and MSMEs to climate risk through private insurance. The component will finance the following activities at the State and Pilot city levels:

A. **Conducting Analytics and Informing Government Policies on Private Capital Mobilization** (Total: US$0.9 million; IBRD: US$0.63 million; GoM: US$0.27 million), through development

of analytical tools, guidelines, and technical studies (incl. demand assessments for the climate finance products to be supported under the project).

B. **Establishing the Maharashtra Resilience Financing Program** (MARP) (Total: US$17.3 million; IBRD: US$12.11 million; GoM: US$5.19 million; Commercial Financing: US$800 million) to provide financial incentives for homeowners and MSMEs to invest in climate-proofing their homes and businesses and increase their financial resilience to disasters through insurance. The activities financed under this sub-component include but are not limited to:
   (i) Provision of partial rebates to homeowners and MSMEs that took out home or property improvement loans from commercial banks (accredited financial institutions) to finance climate- proofing of housing and business assets. PCM of US$300 million is estimated based on 10,000 loan rebates of on average US$1,000 for loan sizes of US$30,000.
   (ii) Insurance premium subsidies for qualifying catastrophe insurance products provided by accredited insurance companies (e.g., insurance coverage for climate hazards linked to mortgages or home-improvement loans or coverage against business interruption or damage to business inventories caused by climate disasters). PCM of US$500 million is estimated based on 20,000 insurance premium subsidies at an average of about US$50 premium, i.e. 0.2 percent of the average insured value.
   (iii) Grants for homeowners and business associations to implement local climate-proofing projects (e.g., drainage improvements, retaining walls, slope stabilization).

C. **Developing Skills and Building Public Awareness** (Total: US$0.8 million; IBRD: US$0.56 million; GoM: US$0.24 million), through skill development activities at existing vocational training programs to ensure sufficient supply of qualified labour for green jobs (e.g., building climate-proofing) and increasing public awareness of climate finance products and structural improvements that can be financed to enhance the climate and disaster resilience of private dwellings.

Component 5: Implementation Support and Knowledge Management (Total: US$22 million; IBRD: US$15.4 million; GoM: US$6.6 million). This component includes project and knowledge management activities, i.e.,

(i) Capacity building,
(ii) Coordination, financial management, procurement, environmental and social risk management, communication, monitoring and evaluation, and stakeholder engagement, and the
(iii) Development of a knowledge lighthouse for dissemination at state and country level. Institutional and Implementation Arrangements The proposed project implementation setup involves the establishment of a Project Management Unit (PMU) and several Project Implementation Units (PIUs). The PMU will be set up at MITRA, including a high-level Steering Committee for regular monitoring and coordination. A PIU for disaster risk management activities will be within the State Relief and Rehabilitation Department (R&R) and for activities at river basin level within the Maharashtra Krishna Valley Development Corporation (MKVDC) within the Water Resources Department. Both agencies have experience of implementing externally aided projects, including World Bank financed projects. Three PIUs will be set up at the municipal corporations of Kolhapur (KMC), Sangli-Miraj-Kupwad City (SMKMC) and Ichalkaranji (IMC) respectively. MITRA will be responsible for the implementation of

Component 4. Capacity constraints in PIUs with less experience handling externally aided projects will be addressed through pro-active training, support from MITRA, and hiring Project Management and Technical Consultancy firms.

1.7 Component Specific Identified sub-projects

The gist of component specific, so far identified sub-projects are provided in the table below:

Table 1: Component Specific identified sub-project

Sr. No	Identified sub-project
Component 1	
1.	Upgradation of the existing Real Time Data Acquisition System (RTDAS)
2.	Upgradation of Data Centre at Pune
3.	Strengthening existing Real Time Stream Flow and Decision Support System (RTSF and DSS), i.e. operation flood forecasting system and developing Climate Informed Integrated Reservoir Operation and Management System, including capacity building, software and manpower for 5 years.
4.	Website Development for Flood Alerts, Flood Related Data and Information Dissemination
5.	Retrofitting of existing sluice gates and provision of additional spillway to Radhanagari dam.
6.	Replacing the hydraulically inefficient Sangli KT Weir with barrage;
7.	Rejuvenation of Existing Natural Drainage System draining into Krishna River
8.	Rejuvenation of Existing Natural Drainage System draining into Panchganga River
9.	River Training Works (To be finalized after river flow modelling) (In respect of component -1, detailed survey investigation of the entire river system of 1455 km, hydrological and hydraulic modelling are required to be done, before finalizing the interventions. The survey is almost complete, and hydraulic modelling is in progress. Hence, river interventions under this component are yet to be finalized. However, based on preliminary model studies, following broad interventions have been identified, which will be finalized in due course on the basis of model studies.) (Such interventions shall be comprising of restoration of natural river cross sections of the rivers, Restoration of paleo channels, desilting, removing Rock out crop, straightening of meanders, construction of levees/flood embankments / flood walls, retrofitting of hydraulically inefficient and redundant in line structures on rivers etc.)
10.	Implementation and maintenance of existing and construction of new flood mitigation water storage structures in Krishna and Panchganga river free catchment in Kolhapur and Sangli districts.
Component 2	
11.	Construction and implementation of Storm Water Works for Urban Flood Mitigation in Kolhapur Municipal Corporation (KMC).
12.	Construction and implementation of Storm Water Works for Urban Flood Mitigation in Sangli-Miraj-Kupwad Municipal Corporation (SMKMC).
13.	Construction and implementation of Storm Water Works for Urban Flood Mitigation in Ichalkaranji Municipal Corporation (IMC).

Sr. No	Identified sub-project
14.	Preparation of Landslide Hazard Assessment & Detailed Project Report for Landslide Mitigation Measures across eight identified sites in Kolhapur District, Maharashtra and implementation of the landslide mitigation measures.
Component 3	
15.	Services of Integrated Emergency Operation Centre (EOC) Management Suites (IEMS) for EOCs
16.	Development of the Climate inclusive multi-hazard vulnerability assessment for Maharashtra (HRVA, DRDB, Dynamic and Digital Disaster Risk Assessment) and integration with IEMS
17.	Flood EW Dissemination System for the Krishna Basin (mechanism tbd, after onboarding IEMS consultant, WRD/MKVDC) and integration with IEMS.
18.	Development and installation of Landslide EWS (Local Systems Lo-LEWS) and integration with IEMS (mechanism tbd, after completion of landslide hazard and risk assessment study under the consultancy services for mitigation work in 8 sites of Kolhapur)
Component 4	
19.	Development of Digital Platform for disbursement of premium subsidy to beneficiaries
Component 5	
20.	Strategic Study and Capacity Building for Knowledge Framework and Resilience Development cities, including detailed GIS study for city resilience
21.	Resilience and Feasibility Analysis for River Flooding Resilience and Disaster Resilience and Development of Knowledge Lighthouse for resilience in Maharashtra, including institutionalization of NDMA guidelines

1.8 Implementing Agencies

The project will be implemented through 5 Project Implementing Units (PIUs): Maharashtra Krishna Valley Development Corporation (MKVDC), the Relief & Rehabilitation Department (Government of Maharashtra), and three Urban Local Bodies (ULBs)—Kolhapur Municipal Corporation, Sangli-Miraj-Kupwad Municipal Corporation, and Ichalkaranji Municipal Corporation. These PIUs will be responsible for executing specific components of the project within their respective jurisdictions.

Maharashtra Institution for Transformation (MITRA) is the nodal agency, responsible for coordinating and overseeing the implementation of the Maharashtra Resilience Development Project (MRDP). The details of component specific implementing agencies are provided in the table below:

Table 2: Details of component specific implementing agencies

Sr. No	Component	Implementing Agencies
1	Climate-Informed Flood Risk Management	Maharashtra Krishna Valley Development Corporation (MKVDC), under Water Resources Department (WRD)
2	Multi-Hazard Resilience in Districts and Cities	Kolhapur Municipal Corporation (KMC), Sangli, Miraj and Kupwad Municipal Corporation (SMKMC), Ichalkaranji Municipal Corporation (IMC)

Sr. No	Component	Implementing Agencies
3	Enhanced Emergency Management and Early Warning Capacities	Relief and Rehabilitation (R&R) Department
4	Private Capital Mobilization for Risk Financing	Maharashtra Institution for Transformation (MITRA)
5	Implementation Support and Knowledge Management	Maharashtra Institution for Transformation (MITRA)

1.9 Requirement of Land Acquisition

Sub-project specific extent of land acquisition and displacement, based on the information available so far is as below:

- River works including nalla rejuvenation works: The interventions are not yet finalised. Hence exact figure can't be given at this stage. However, as an estimate this component will require 75 Ha of Government land and 140 Ha of private land for the river works. Approximate number of landlords has been estimated to be 120 (Average land to be acquired per title holder will be 1.60 Ha approximately). Based on the drone survey, and walkthrough survey no structures are likely to be impacted. As per the walkthrough survey and drone survey it do not involves any physical displacement.
- Construction of new water storage structures in free catchment of Krishna and Panchganga River in Kolhapur and Sangli districts : The interventions are not yet finalised. Hence exact figure can't be given at this stage. However, as an estimate this component will require 50 Ha of private land will be required. It will also require some physical displacement. Approximately 50 HHs are likely to be affected (total displacement in multiple storage structures)

1.10 Potential Environmental and Social Benefits and Risks

Sub-project specific potential benefits, Environmental and Social (E&S) risks as well as SEA/SH risks are identified in Chapter 5 of the document, following a systematic process that begins with preliminary screening, of the sub-project, location and regulatory triggers using a standard template, followed by identification of key Environmental and Social risks such as Pollution, Biodiversity impact, Land Acquisition, Labour issues, Community health and Safety, Cultural Heritage concerns etc. These risks are then evaluated based on their nature, scale, magnitude, duration, reversibility and borrower's institutional capacity to manage them and assigning appropriate weight / score for each of the risk parameter depending on the nature of its severity.

Overview of E&S and SEA/ SH risk categorization

- Sub-project involving civil works related to Radhanagari dam has Substantial E&S risk and Substantial SEA/ SH risks.
- Civil works related to river training works, new water storage works, landslide mitigation works, urban storm water works has Substantial E&S and SEA / SH risks.
- Civil works related to maintenance of existing water storage structures in free catchment has moderate E&S and SEA/ SH risks.
- Digital intervention based sub-projects / capacity building sub-projects / feasibility studies have low E&S and SEA/ SH risks.

Although, the work of providing additional spillway gates to existing Radhanagari dam, completed in 1954, lies within 10 km radius from Radhanagari Wildlife Sanctuary, it's implementation is investable for the safety of the dam, mitigating flood risks and extension of the life of the dam. It is a must do sub-project for sustaining the socio-economic developments boosted by the dam and biodiversity developed on the fringe of the reservoir.

This sub-project does not involve any acquisition of private land or displacement or diversion of any forest land. In this particular case, there is a submergence of dam, between Wildlife Sanctuary boundary and the work site. Hence, no wildlife corridors will be affected due to the implementation of the sub-project. The workspace is in the possession of the Water Resources Department. However, prior permission under the Wildlife (Protection) Act 1972 will be taken. **The proposal for the Wildlife clearance has already initiated and Chief Conservator of Forests (Wildlife) Mumbai has recommended the proposal, as there is no diversion of forest land.**

1.11 Responsive and Sustainable Implementation through ESMF

MRDP proposes to undertake various interventions as listed in table above. As stated there in, with due reasoning, the exact extent and precise location/footprints of individual river interventions (subprojects) to be implemented, under the proposed Project are not known at this stage, therefore, a ESMF approach has been adopted to serve as an instrument to guide the Implementing Agencies, on undertaking necessary E&S Screening of each sub-project.

The Environmental and Social Management Framework (ESMF) is designed to guide the identification, assessment, and management of environmental and social risks for World Bank-financed projects, particularly when project details or locations are not fully defined at the outset. **The ESMF will provide a framework for identifying and managing environmental and social risks and ensuring that the project is implemented in a responsible and sustainable manner.** The other objectives of preparing for ESMF are:

- **To identify potential environmental and social risks and impacts**—both positive and negative—associated with the proposed project activities at a broader level, and to propose mitigation measures that will effectively address these risks and impacts.
- **To establish clear procedures and methodologies** for environmental and social screening, assessment, review, approval, and implementation of subprojects and activities financed under the project.
- **To specify appropriate roles and responsibilities** and outline the necessary reporting procedures for managing and monitoring environmental and social issues related to subprojects.
- **To ensure compliance with policy, legal, and regulatory requirements**, including national laws, state norms, and the World Bank's Environmental and Social Standards (ESSs).
- **To provide guidelines and generic plans** to avoid, reduce, minimize, or mitigate adverse environmental and social impacts, and to enhance positive outcomes.
- **To determine the training, capacity building, and technical assistance needs** required for successful implementation of the ESMF by project stakeholders and implementing agencies.

- **To facilitate stakeholder engagement and public consultation**, ensuring transparency, disclosure of project documents, and the establishment of effective grievance redress mechanisms.
- **To establish a plan for monitoring and reporting** on the implementation of environmental and social mitigation measures throughout the project lifecycle.
- **To standardize the preparation and review of environmental and social documents**, improving the quality and consistency of analysis and documentation across all project components.

The ESMF serves as a comprehensive framework to ensure that environmental and social considerations are systematically integrated into project planning and implementation, in line with World Bank requirements and best practices.

2 POLICY LEGAL AND REGULATORY FRAMEWORK

2.1 Background

This chapter focuses on legal framework that would be applicable for MRDP. Subproject specific EMPs will be formulated following this legal framework and religiously implemented to safeguard the environmental and social issues.

The article 48-A of the Constitution of India states that every State shall endeavour to protect and improve the environment to safeguard the forest and wildlife. At the same time, it shall be the fundamental duty of every citizen of India under Article 51 A (9), of the constitution to protect and improve the natural environment including forests, lakes, rivers and wildlife. Accordingly, the Government of India has enacted various Policies, Acts, Rules and Regulations hereinafter collectively referred as "Laws".

The implementation of the Project would be governed by all the Rules and Regulations enforced by the Ministry of Environment, Forest and Climate Change (MoEFCC) at National level and other regulatory agencies at State level. Various environmental standards specifications of Central Pollution Control Board (CPCB) and Maharashtra State Pollution Control Board (MPCB) will also be applicable.

Furthermore, since the Project is funded by World Bank, implementation of the Project is guided by the Environmental and Social Framework (ESF 2018) of the World Bank.

In case of gaps, amongst the requirements of Laws and World Bank guidelines, more stringent requirement will prevail. This will ensure the project implementation compliant to environmental and social measures of the highest standards while promoting sustained inclusive development.

2.2 World Bank ESS standards

The World Bank has set up Environmental and Social Framework with an objective of responsive and sustainable implementation of the project.

These Environmental and Social Standards set out the requirements related to the identification and assessment of environmental and social risks and impacts associated with projects These standards will: (a) support borrowers in achieving good international practice relating to environmental and social sustainability; (b) assist borrowers in fulfilling their national and international environmental and social obligations; (c) enhance non-discrimination, transparency, participation, accountability and governance; and (d) enhance the sustainable development outcomes of projects through ongoing stakeholder engagement. The World Bank's Environmental and Social Standards relevant to MRDP are mentioned in the table below:

Table 3: The World Bank's Environmental and Social Standards relevant to MRDP

Environment & Social Standard	Objective(s) of the ESS	Relevance	Strategies and Actions to fulfil ESS Requirements
ESS1: Assessment and Management	• Identify, assess, and manage environmental and	• The standard is relevant as the project involves large-scale infrastructure development, which may	• Develop an Environmental and Social Management Framework (ESMF) before

Environment & Social Standard	Objective(s) of the ESS	Relevance	Strategies and Actions to fulfil ESS Requirements
of Environmental and Social Risks and Impacts	social risks and impacts of projects. • Promote sustainable development by integrating environmental and social considerations into decision-making. • Ensure Borrowers manage risks through mitigation measures and stakeholder engagement.	have significant environmental and social impacts. • Environmental risks may include soil erosion, water pollution, and loss of biodiversity and social risks involve displacement of communities, changes in livelihoods, and impacts on public health. • A comprehensive Environmental and Social Impact Assessment (ESIA) is required to identify, assess, and mitigate these risks.	negotiations and implement it throughout the project. • Preparation of ESIA and ESMP, consistent with relevant ESSs for each individual sub-project prior to invitation of bids for the civil works. • Integrate ESMP in respective bidding document. • Sub-project specific C-ESMP will be prepared and implemented throughout the project implementation. • Ensure that the contractors and supervising firms comply with E&S specifications and contractual remedies will be revoked in case of non-compliance. • Consultancy's studies, capacity building and training activities will be aligned with the ESF and ESSs. • Create / establish monitoring and reporting system for E&S aspects which captures real time data / information from field within 3 months from commencement of the project. • Develop a functional MIS for MRDP which includes E&S performance indicators and implement it, within 6 months from commencement of the project. • Preparation and submission of quarterly monitoring reports on Environmental, Social, Health and Safety,

Environment & Social Standard	Objective(s) of the ESS	Relevance	Strategies and Actions to fulfil ESS Requirements
			within 15 days after the end of reporting period. • Submission of mid-term report, before initiation of mid-term review mission. • Submission of end-term report at least 30 days before project closure.
ESS2: Labour and Working Conditions	• Protect the rights and well-being of project workers. • Promote fair treatment, non-discrimination, and equal opportunity in the workplace. • Ensure safe and healthy working conditions, preventing forced and child labour.	• This standard is relevant as the project is going to work with different kinds of labour of all categories, direct, indirect, contract, primary, etc., at different levels, and labour influx related risks are likely. The construction activities will be labour intensive, making labour rights, fair wages, and safe working conditions crucial. • Occupational health and safety (OHS) risks include working near water bodies, handling heavy equipment, and exposure to hazardous materials. • Measures such as worker training, protective gear, and grievance redress mechanisms should be in place.	• Prepare and disclose, Labour Management Procedure (LMP) before negotiations and implement it throughout the project implementation. • Integrate requirements of LMP in bidding document for civil works. • Prepare detailed OHS management plan within 3 months from the project commencement date. • Integrate the OHS management plan requirements in TOR / designs/ DPR and bidding documents of each sub-project prior to invitation of bid. • Ensure safe, fair, and healthy working conditions • Prohibit child and forced labour • Establish GRM for project workers consistent with the provisions in LMP and ESS 2 prior to engagement of project workers and operate it throughout the implementation.
ESS3: Resource Efficiency and	• Promote sustainable use of resources	• The project must optimize the use of construction materials	• Prepare and implement site specific, sub-project specific Waste Management Plan

Environment & Social Standard	Objective(s) of the ESS	Relevance	Strategies and Actions to fulfil ESS Requirements
Pollution Prevention and Management	(energy, water, raw materials). • Avoid or minimize pollution (air, water, land, hazardous waste, noise). • Support climate change mitigation through energy efficiency and waste management.	and water resources to ensure sustainability. • Potential pollution risks include increased sedimentation, waste generation, and contamination from construction activities. • Efficient stormwater management and sediment control measures must be implemented.	(WMP) as a part of ESMP, before invitation of bids. • Incorporate resources efficiency and pollution prevention management measures in sub-project specific ESMP, which will include resource optimization efforts for water, energy and construction materials, before the invitation of bids. • Integrate the requirements, regarding the maintenance of the records of resource use and pollution management will be made mandatory, on contractors and consultants, by specifying the necessary conditions in TOR / bidding documents. • Promoting the use of environmentally sustainable construction materials. • Prevent air, water, and soil contamination during project activities.
ESS4: Community Health and Safety	• Ensure projects do not negatively impact community health and safety. • Address risks from infrastructure, hazardous materials, and natural disasters. • Promote emergency preparedness and response strategies.	• Construction activities may lead to dust, noise, and traffic congestion, affecting nearby communities. • Structural integrity of dams and drainage systems must be ensured to prevent failures leading to flooding. • Measures such as early warning systems, emergency response plans, and public awareness programs should be included.	• Measures to manage traffic and road safety risks will be incorporated in bidding documents of civil works, particularly in respect of implementation of storm water drainage systems, under component 2 of MRDP. Thereafter, these measures will be implemented throughout the project implementation. • Sub-project specific risks and impacts to the community, arising out of project activities including, inter-alia, behaviour of the project workers, risks of labour

Environment & Social Standard	Objective(s) of the ESS	Relevance	Strategies and Actions to fulfil ESS Requirements
			influx, etc. will be assessed and included in the project design and bidding document prior to invitation of bids. • Prepare SEA/ SH Action Plan within 3 months from the commencement of the project and implement it throughout the implementation stage . **Component 1- Radhanagari dam specific civil works measures:** • Dam safety assessment, through independent dam safety review panel, prior to invitation of bids. • Review of detailed designs and bidding documents for alternative spillway works by the panel and the World Bank and their comments / suggestions will be incorporated in the bidding document. • Preparation of detailed Construction Supervision and Quality Assurance Plan (CSQAP), Instrumentation Plan (IP), Operation and Maintenance Plan (O&MP) prior to bidding. • Preparation of Emergency Preparedness Plan (EPP), no later than 12 months prior to impoundment.
ESS5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement	• Avoid or minimize displacement due to land acquisition. • Provide compensation and resettlement support for affected people. • Improve or restore the livelihoods of displaced persons.	• This standard is relevant as many of the interventions planned under the project may require private land acquisition and have impacts on both titleholders and non-titleholders	• Prepare and disclose Resettlement Policy Framework (RPF) prior to negotiations and implement it throughout the project implementation. • Prepare and implement Resettlement Action Plan (RAP), for the sub-projects requiring land acquisition / resettlement, before bidding.

Environment & Social Standard	Objective(s) of the ESS	Relevance	Strategies and Actions to fulfil ESS Requirements
			• Payment of full compensation and applicable allowances before commencement of the works. • Restore the livelihoods of displaced people.
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	• Protect biodiversity and promote sustainable management of ecosystems. • Prevent harm to natural habitats and critical ecosystems. • Encourage responsible management of renewable resources.	• River widening and stormwater drain construction may affect aquatic and riparian ecosystems. • Measures should be in place to protect biodiversity, prevent habitat loss, and promote reforestation if necessary.	**Component 1- Radhanagari dam specific civil works measures:** • Conduct a detailed Critical Habitat Assessment (CHA) and Biodiversity Assessment (BA) and prepare Biodiversity Management Plan (BMP), prior to invitation of bids. • Incorporate the findings of CHA / BA study and BMP in the sub-project design and bidding document prior to invitation of bids. • For sub-projects outside the designated protected domains where environmental screening identifies potential risks or adverse impact, conduct Biodiversity Assessment (BA) and prepare BMP with appropriate measures (commensurate with findings of BA), before the invitation of bids.
ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	• Ensure respect for the rights, culture, and well-being of Indigenous Peoples. • Promote their participation in decision-making processes. • Provide equitable access to project	• This standard is of low relevance as the identified project interventions and areas will have very low or no interface with the indigenous communities. But if any such area or community found during the project, MRDP will	• In MRDP project area, indigenous communities are not present.

Environment & Social Standard	Objective(s) of the ESS	Relevance	Strategies and Actions to fulfil ESS Requirements
	benefits and avoid negative impacts.	be following ESS8 guidelines.	
ESS8: Cultural Heritage	• Protect cultural heritage from adverse impacts of projects. • Promote the conservation of tangible and intangible heritage. • Support community involvement in heritage protection and management.	• The project might impact historical or religious sites near rivers, dams, or urban drainage systems. • Chance-find procedures should be implemented to protect cultural heritage during excavation.	**Component 1- Radhanagari dam specific civil works measures:** • The sub-project site has cultural heritage. Hence, Cultural Heritage Management Plan (CHMP), consistent with ESS 8, will be prepared as a part of ESMP, prior of to the invitation of the bids and CHMP will be implemented. • Identify and assess cultural heritage sites through expert surveys and community consultation which will avoid or mitigate impacts via design changes and protective measures. • Integrate / describe Chance Finds Procedures in ESMP and implement it throughout the project implementation. • Regular monitoring and stakeholder engagement will support ongoing protection.
ESS10: Stakeholder Engagement and Information Disclosure	• Ensure meaningful consultation and engagement with stakeholders. • Promote transparency by providing access to project information. • Encourage grievance mechanisms to address community concerns.	• This standard is relevant, as stakeholders need to be consulted throughout the project preparation and implementation period and also duly informed through disclosure of project related information.	• Disclose Stakeholder Engagement Plan (SEP) before negotiations and implement throughout the project implementation. • Conduct inclusive, culturally appropriate consultations. • Disclose project information in accessible formats. • Establish, publicize, maintain and operate, an accessible responsive and transparent Grievance Redressal Mechanism (GRM), to

Environment & Social Standard	Objective(s) of the ESS	Relevance	Strategies and Actions to fulfil ESS Requirements
			receive and facilitate resolutions, of concerns and grievances, in relation to the project, at no cost and without retribution for stakeholders, within 1 month from the commencement of the project and operate it throughout the project implementation. • GRM will be equipped to receive, register and facilitate the resolution of SEA / SH complaints, in a safe, confidential and survival cantered manner.

Sub-project specific ESS applicability triggers and safeguard instruments are provided in Chapter 5.

2.3 Applicable Environmental Laws

2.3.1 International Laws (Ratified by GoI)

Under the MRDP project, various international environmental laws (including policies, codes, and rules) are relevant to ensure environmental sustainability, social safeguards, and climate resilience. A list of key international frameworks and their relevance is mentioned in the table below:

Table 4: Applicable International laws relevant to environmental aspect

Name of the Laws, policies and rules	Mandate of the Act/ Policy	Relevance to the project
World Bank ESF policy Safety of Dams	Safety of Dams ensures dams are designed, constructed, and operated safely, minimizing risks to human life, property, and the environment through comprehensive safety measures.	Yes. In MRDP no new dams are proposed except small water flood retention tanks. However, this may help in the operation of existing dams.
ISO 14001 - Environmental Management Systems	ISO 14001 provides a framework for organizations to establish, implement, and improve environmental management systems, ensuring sustainable practices, compliance with regulations, and reduced environmental impact.	Yes. Although the standards can't be made mandatory for all the implementing agencies during the procurement process, comparative advantage be given to ISO complaint certificate agency wherever practicable.

2.3.2 National Laws

Important national laws (including policies, codes, and rules) relevant to MRDP project are listed in the table below:

Table 5: Applicable National laws relevant to environmental aspect

Name of the Laws, policies and rules	Mandate of the Act/ Policy	Relevance to the project
The Environment (Protection) Act, 1986	This is an umbrella Act under which various notifications, rules, standards and schedules are promulgated. The objective of this Act is to protect and improve the environmental quality and preventing controlling and abating environmental pollution.	Yes. Ensures that flood mitigation projects adhere to environmental safeguards and minimize adverse impacts on air, water, and soil quality.
The Water (Prevention and Control of Pollution) Act, 1974	The purpose of this Act is to control water pollution and maintain, restore the water quality.	Yes. Particularly relevant to the effluent of the labour camps and also to river interventions.
The Air (Prevention and Control of Pollution) Act, 1981	To control air pollution by controlling emission of air pollutants as per the prescribed standards.	Yes. Important for managing air quality during construction activities.
The Forest (Conservation) Act, 1980	To check deforestation by restricting conversion of forested areas into non-forested areas.	No. As, in MRDP, no diversion of forest land is required.
The National Disaster Management Act, 2005	To provide a legal framework for effective disaster risk reduction, preparedness, mitigation, and response at national, state, and district levels.	Yes. Crucial for flood preparedness and response.
The Wetlands (Conservation and Management) Rules, 2010	This rule provides guidance for the conservation and management of wetlands in India by regulating activities within notified wetlands to prevent their degradation.	Yes. Protection of wetlands from dumping construction debris.
The Biological Diversity Act, 2002	This Act is mandated to provide for conservation of biodiversity, sustainable use of resources fair and equitable sharing of the benefits from use of resources.	Yes. Protection of local biodiversity or ecosystems in project area.
Wildlife Protection Act, 1972	Provides legal protection to wildlife and habitats through regulated conservation, hunting bans, protected areas, and enforcement mechanisms.	Yes. To avoid disturbance to the wildlife movements in the project area. Avoid sound and vibration disturbances. This will be applicable particularly to Radhanagari spillway work
Forest (Conservation) Rules, 2023	These rules provide framework for diversion of forest area for non-forest uses.	No. Diversion of forest land or execution of the project is required.
The Forest Rights Act, 2006	This act provides the recognition and vesting of forest rights and occupation in forest land to Scheduled Tribes and other traditional	No.

Name of the Laws, policies and rules	Mandate of the Act/ Policy	Relevance to the project
	forest dwellers who have been residing in such forests for generations.	
The Environmental Impact Assessment EIA Notification 2006 & subsequent amendments	To provide environmental clearance to new or expansion project listed under the schedule of the Notification following environmental impact assessment study.	Yes. Relevant to interventions that involve significant land use changes or construction activities.
The National Action Plan on Climate Change (NAPCC)	Outlines India's strategy to combat climate change through eight missions focusing on adaptation, mitigation, and sustainable development.	Yes. Helps for deciding the design flood duly considering the likely Climate Change impact.
The Disaster Management Policy, 2009	Aims to build a disaster-resilient India through proactive prevention, preparedness, and mitigation strategies.	Yes. Provides guidelines for flood risk management and prevention, ensuring the effectiveness of flood mitigation efforts.
The Energy Conservation Act, 2001	Promotes efficient energy use and conservation through regulatory mechanisms and institutional support.	Yes. Helps to ensure energy-efficient technologies and sustainable practices in implementation of the Project.
The National Forest Policy, 1988	Ensures environmental stability and ecological balance through forest conservation and community participation.	Yes. Ensures flood mitigation projects integrate forest preservation, especially in areas that reduce flood risk, such as watersheds and catchment areas.
The Hazardous Waste Management Rules, 2016	Empowers citizens to access information from public authorities to promote transparency and accountability.	No. Relevant to particularly upgradation of SWD and DEOC. As project do not require any forest land.
Construction and Demolition (C&D) Waste Rules, 2016	These rules ensure proper disposal of construction and demolition waste.	Yes. Applicable to all subprojects involving civil works.
Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites Remains Rules, 1959	These Acts aims to preserve ancient and historical monuments and Archaeological sites.	Yes. If project interventions come under these sites.

Name of the Laws, policies and rules	Mandate of the Act/ Policy	Relevance to the project
The Right to Information Act (2005)	Empowers citizens to access information from public authorities to promote transparency and accountability.	Yes. Facilitates transparency and accountability in project implementation.
The Solid Waste Management Rules (2016)	Establishes a decentralized and inclusive framework for scientific management of solid waste across India	Yes. Addresses waste management in project activities, especially in urban areas.
The National Policy on Urban Flooding (2010)	Advocates integrated urban flood management through infrastructure resilience and coordinated response systems.	Yes. Directly applicable in managing flood mitigation efforts in cities, especially in flood-prone urban areas.
The National Green Tribunal Act (2010)	The act mandates the establishment of a specialized tribunal for speedy and effective resolution of environmental disputes, ensuring protection of natural resources and enforcement of environmental right.	Yes. Provides a legal platform to address environmental concerns arising from projects activities

2.3.3 State Laws

Important environmental-related laws enacted by the State of Maharashtra relevant to MRDP project are listed in the table below:

Table 6: Applicable state laws relevant to environmental aspect

Relevant Acts and Policies of GoM	Relevant to environmental aspects	Relevance to the project
Maharashtra Pollution Control Board (MPCB) Regulations	Regulates pollution control, enforces environmental laws, and ensures compliance with air, water, and waste management standards.	Yes. Provisions need to be followed during the execution of the Project.
Maharashtra Water Resources Regulatory Authority Act, 2005	The Act enables to regulate, allocate, and manage water resources in Maharashtra. It ensures equitable distribution, sets water tariffs, and resolves disputes among users	Partially Yes. Aspect of flood mitigation is not covered under this statute; however, mitigation measures shall be designed and implemented in such a way that existing water use rights are not disturbed.
Maharashtra State Water Policy, 2019	Promotes integrated water management, equitable distribution, and sustainable use of water resources across sectors.	Yes. Clause no. 19 of the said policy deals with flood management. The said provisions shall be considered.
Maharashtra State Action Plan on Climate Change, 2014	Guides climate resilience and low-carbon development through sectoral adaptation and mitigation strategies.	Yes. Guides the integration of climate resilience into flood mitigation planning.

Relevant Acts and Policies of GoM	Relevant to environmental aspects	Relevance to the project
Maharashtra Regional and Town Planning Act, 1966	Provides a legal framework for regional and urban planning to ensure orderly development and land use.	Yes. Relevant particularly to flood mitigation works in cities.
Maharashtra State Disaster Management Plan, 2016	Outlines institutional mechanisms and strategies for disaster preparedness, response, and risk reduction	Yes. Guides flood response strategies within the project.
Maharashtra State Biodiversity Strategy and Action Plan, 2008	Focuses on conservation, sustainable use, and equitable sharing of biodiversity benefits in Maharashtra.	Yes. Ensures that flood mitigation projects do not adversely impact biodiversity.

2.3.4 Applicable Social Laws

2.3.5 International Laws (Ratified by GoI)

Key International regulatory framework on critical social aspects are listed in the table below:

Table 7: Applicable International laws and treaties relevant to social aspect

Category	Relevant International Laws & Treaties	Relevance to the project
Labour (Working Conditions, Informal Labour, Construction Labour, Labour Camps, etc.)	India has ratified several fundamental ILO conventions, which directly inform the MRDP's labour and social compliance. These include: • Forced Labour Convention (No. 29) • Abolition of Forced Labour Convention (No. 105) • Equal Remuneration Convention (No. 100) • Discrimination (Employment and Occupation) Convention (No. 111) • Minimum Age Convention (No. 138) 1. Worst Forms of Child Labour Convention (No. 182). 2. UN Universal Declaration of Human Rights (UDHR) 3. International Covenant on Economic, Social and Cultural Rights (ICESCR) 4. ILO's Decent Work Agenda 5. UN Guiding Principles on Business and Human Right	Yes - Freedom of association and collective bargaining - Prohibition of forced labour and child labour - Right to fair wages and safe working conditions - Protection of informal and migrant workers - Corporate responsibility in labour standards

Category	Relevant International Laws & Treaties	Relevance to the project
Occupational Health and Safety	1. ILO Convention C155 (Occupational Safety and Health) 2. ILO Convention C187 (Promotional Framework for Occupational Safety and Health) 3. WHO Global Strategy on Occupational Health for All 4. Basel Convention on Hazardous Waste	Yes - Applicable during project implementation. Establishment of occupational health standards - Prevention of workplace accidents and diseases - Right to a safe and healthy working environment - Hazardous waste management
Gender-Based Violence	1. UN Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) 2. UN Declaration on the Elimination of Violence Against Women 3. ILO Convention C190 (Violence and Harassment Convention) 4. UN Sustainable Development Goals (SDG 5)	Yes - Protection against workplace harassment and abuse - Gender-sensitive policies and legal frameworks Access to justice and survivor support services
ISO 45001 - Occupational Health & Safety	ISO 45001 outlines requirements for an occupational health and safety management system, helping organizations ensure worker safety, reduce risks, and foster a healthy work environment.	Yes. Although the standards can't be made mandatory for all the implementing agencies during the procurement process, comparative advantage be given to ISO complaint certificate agency wherever practicable.
WHO Water Safety Plans (WSPs)	WHO Water Safety Plans (WSPs) provide a risk management approach to ensure safe drinking water, emphasizing source protection, quality monitoring, and effective treatment throughout the water supply chain.	Yes. Applicable for drinking water supply to labour camps.

2.3.6 National Laws

The key national acts relevant to the project are given in the table below:

Table 8: Applicable National Laws relevant to social aspects

Act / Rules	Key Features	Applicability to the project
The Right to Fair Compensation and Transparency in Land	Mandates Social Impact Assessment (SIA), consent from affected families, fair market-based compensation, rehabilitation and resettlement packages, and	Yes. The provisions in the Act shall be followed during the land acquisition for the project.

Act / Rules	Key Features	Applicability to the project
Acquisition, Rehabilitation and Resettlement Act, 2013	safeguards for food security and vulnerable groups	
Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013	Requires constitution of Internal and Local Complaints Committees, defines sexual harassment, prescribes inquiry procedures, employer duties, and mandates annual reporting and training.	Yes. Supports the encouraging and safe work environments for the women, during project implementation
Child Labour (Prohibition and Regulation) Act, 1986	Prohibits employment of children under 14 in hazardous occupations; regulates working hours, holidays, health and safety for permitted work; mandates age verification and record maintenance	Yes. Prevents child exploitation in Project's implementation and field operations.
The Bonded Labour System (Abolition) Act 1976	Abolishes bonded labour, cancels bonded debts, prohibits forced labour under social customs, and empowers authorities to rehabilitate freed labourers and prosecute offenders.	Yes. To prevent exploitation of labours at work sites.
Workmen's Compensation Act, 1923 & Rules 1924	Provides compensation for injury, disability, or death arising from employment; defines calculation methods, medical examination protocols, and dispute resolution via Commissioners.	Yes. Enhances occupational safety and social protection during project implementation. The provisions under this Act shall be made mandatory in all the Contracts under the Project.
The Contract Labour (Regulation and Abolition) Rules, 1971	Regulates registration of establishments and licensing of contractors; mandates welfare provisions like canteens, restrooms, first aid, and wage payment responsibility of principal employer.	Yes. Ensures ethical labour practices in public-private partnerships and project activities.
The Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act 1996	Requires registration of workers and establishments; mandates welfare boards, safety measures, working hours, maternity benefits, and provision of housing and sanitation.	Yes. Helps in labour welfare management activities.
The Right to Information Act, 2005	Grants citizens access to information held by public authorities; mandates appointment of Public Information Officers, time-bound responses, exemptions,	Yes to ensure transparency in implementation of the Project.

Act / Rules	Key Features	Applicability to the project
	and appeals to Information Commissions.	
Code on Wages (2019)	The definition of "Wages" is standardised and include basic pay, dearness allowance and retaining allowance. Statutory "Floor wage" is set based on minimum living standards. Minimum wages now apply to all sectors. Code prohibits gender-based discrimination in wages (Equal pay for equal work).	Yes. This provision needs to be monitored by incorporating provisions under this Act in various contracts related to Project.
Industrial Relations Code (2020)	Requires GRC for establishments of 20+ workers. 14 days' notice for strikes. Prior permission of government for retrenchment of 300 workers. Benefits of PF, ESI, Gratuity to fixed term workers.	Yes. Relevant sections of the Act will be applicable.
Code on Social Security (2020)	Women centric provisions such as 26 weeks maternity benefits and creche facility. Extend the coverage of employees provident fund across India.	Yes.
Occupational Safety, Health and Working Conditions Code (OHSWC), 2020	Consolidates thirteen laws; mandates employer duties, safety standards, working hours, leave, welfare facilities, employment of women, and licensing of contractors; introduces Inspector-cum-Facilitators.	Yes. Helps to enhance the safety and health standards for workers by setting out clear guidelines and requirements for workplaces.
Public Liability and Insurance Act 1991	Mandates no-fault liability insurance for industries handling hazardous substances; provides immediate compensation to victims; establishes Environmental Relief Fund and claim procedures.	Yes. Provision needs to be provided in work contracts.
The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	Regulates employment of migrant workers; mandates registration of establishments, licensing of contractors, payment of	Yes. Addresses labour mobility and welfare during project activities.

Act / Rules	Key Features	Applicability to the project
	displacement and journey allowances, and provision of welfare facilities.	

2.3.7 State Laws

Important State specific social-related laws (including policies, codes, and rules) are listed in the table below:

Table 9: Applicable State Laws relevant to social aspects

Relevant Acts and Policies of GoM	Mandate of the Act/ Policy	Relevance to the project
The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (Maharashtra) Rules, 2014 and its subsequent amendments	This rule provides for detailed procedures and implementation mechanisms in Maharashtra for land acquisition, ensuring fair compensation, transparency in the acquisition process, and proper rehabilitation and resettlement of affected persons.	**Applicable** In case of acquisition of private land.
Maharashtra Child Labour (Prohibition and Regulation) Rules, 1997 and its subsequent amendments	This rule provides for the prohibition and regulation of child labour in Maharashtra by laying down guidelines for working conditions, processes where children are prohibited from being employed, and duties of employers	**Applicable** To protect children from exploitation and ensuring their rights to education, health, and a safe environment.
Maharashtra Direct Purchase Policy, 2016 (G.R. No.: Miscellaneous-03/2015/No.34/A-2, dated 12 May 2015)	This policy provides a framework for the direct purchase of private land for public purposes through mutual consent between the landowners and government authorities. It aims to expedite land acquisition by bypassing lengthy legal procedures while ensuring fair compensation, transparency, and consent-based acquisition.	**Applicable.** The provision expedites land acquisition from willing landlords.

2.4 Comparison of ESF and National and State Laws

A comparison of The World Bank's Environmental and Social Standards with the equivalent national and state environmental and social laws has been made and the gaps are identified. Below table presents the identified gaps in World Bank's ESF and National and State laws and reflects remedial measures which the project will follow to fill the gaps.

Table 10: Comparison of ESF and National and State Laws

ESS	Equivalent National Environmental and Social Policy and Regulations	Policy Gaps vs ESS and gap filling (redressal) Measures
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	Environment Protection Act/Rules-1986 Environmental Impact Assessment Notification-2006, 14th Sep-2006, as amended in 2009 and 2013	ESS1 is applicable[4] for all projects, sub-projects and Associated Facilities. Gaps exist regarding assessments, consultations, monitoring and ESCP. The following additional measures are required: • Conduct an environmental and social screening of the proposed project; • Undertake stakeholder engagement and disclose appropriate information in accordance with ESS10; • Develop an ESCP, and implement all measures and actions set out in the legal agreement including the ESCP; and • Conduct monitoring and reporting on the environmental and social performance of the project against the ESSs
ESS2: Labour and Working Conditions	Code of wages 2019, Industrial relations code 2020, Code on social security 2020, Occupational Safety, Health & Working Conditions (OSH) Code, 2020 Child Labour (Prohibition & Regulation) Act 1986, Inter-State Migrant Workmen's (Regulation of Employment & Conditions of Service) Act 1979 Employees Compensation Act 1923 Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013 Bonded Labour System (Abolition) Act, 1976	The National laws cover almost all requirements in ESS2 except relating to community workers and a functional GRM for different types of workers. Hence, an overall project level Labour Management Procedure will be prepared to cover the above requirements. The project specific OHS management plan will use appropriate good international practices/standards (such as WBG EHS guidelines, ILO standards which will be followed in conjunction with requirements defined under various Indian legislations.

[4] Ref para 11, ESS1, ESF 2016

ESS	Equivalent National Environmental and Social Policy and Regulations	Policy Gaps vs ESS and gap filling (redressal) Measures
ESS3: Resource Efficiency, Pollution Prevention and Management	Environment (Protection) Act, 1986 Air Act, 1981 Water Act, 1974 Hazardous Waste Rules	The gaps include limited focus on lifecycle resource efficiency, No mandatory GHG emissions estimation and Weak enforcement of pollution control. The measures will include adopting ESS3 guidelines for resource use and pollution control, and GHG emission control will be prevented. Waste and chemical management plans.
ESS 4: Community Health and Safety	Occupational Safety, Health & Working Conditions (OSH) Code, 2020 Disaster Management Act, 2005 Public Health Acts (State-specific) National Health Mission (NHM) (2005) Includes the **National Rural Health Mission (NRHM)** and **National Urban Health Mission (NUHM)**. **National Policy on Safety, Health and Environment at Workplace**, introduced in 2009 Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013	The gaps include non-requirement for community-level risk assessments, limited provisions for emergency preparedness and no standards for traffic and infrastructure safety. The measures will include conducting community health and safety risk assessments, develop emergency response plans and integrate traffic and infrastructure safety measures. The gaps identified for the NHM and National Policy for Safety, health and environment at workplace are Lack of **coordination** between health and labour ministries, Absence of **integrated data systems** for workplace-related illnesses, Limited **community-level awareness** of occupational hazards, and Inadequate coverage of **informal sector workers** under OHS policies Project is stepping up as a game-changer in bridging the divide between **community health** policies like the NHM and workplace safety frameworks by bringing Urban planning, public health, and occupational safety under one umbrella. The Project also promotes multi-hazard resilient health centers in flood-prone and industrial zones. These centers serve both local communities and informal sector workers, who are often excluded from workplace safety policies Zoning regulations will consider proximity to hazardous sites, ensuring safer living and working conditions. Investments in green and grey infrastructure reduce exposure to floods,

ESS	Equivalent National Environmental and Social Policy and Regulations	Policy Gaps vs ESS and gap filling (redressal) Measures
		landslides, and pollution — all of which impact worker health. The project will also create open data platforms for climate and health risk modeling. And Support digitization of health and safety records, enabling better surveillance of occupational illnesses. The project will also strengthen the capacities of the urban local bodies in risk formed decision making and also encourage community participation in resilience planning. Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013 has jurisdiction on only workspace related SEA/ SH offences. It do not have provision to deal to complaints against community members. General criminal law (IPC section 354, 376, or 509) covers community incidents. Where an assessment identifies risks, for example Gender-Based Violence (GBV) or Sexual Exploitation and Abuse (SEA) of children, or communicable diseases, which may arise from the interaction of project workers with local communities, the environmental and social documents, for the project describe such risks and measures to address them. Such measures can include, more generally, the use of skilled trainers to raise awareness among project workers of the risks, expected behaviors, and consequences of violations, communicated through training, and publicized codes of conduct. It may also be important to raise awareness of the risks among community members and local health authorities and inform them about available grievance mechanisms. The risks and mitigation measures relating to project workers should also be reflected in the labor management procedures for the project. GRM will have provision to deal with SEA / SH complaints, including those against community members. The mechanism will ensure confidentiality, survivor centered approaches and

ESS	Equivalent National Environmental and Social Policy and Regulations	Policy Gaps vs ESS and gap filling (redressal) Measures
		referral to GBV service providers regardless of the perpetrator's identity. In the incident of SEA/ SH by community members, First Information Report (FIR) will be filed at local police station.
ESS 5: Land Acquisition, Restrictions on Land use and Involuntary Resettlement	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	Gap exists specifically related to aspects such as identification of non-titleholders as PAPs; cut off dates for non-titleholders and valuation of structures with depreciation. The gaps will be addressed with suitable provisions in RPF.
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural resources	Wildlife Protection Act, 1972 Forest Conservation Act, 1980 Biological Diversity Act, 2002	The gaps showcase that the focus is mainly on protected areas. There is limited integration of biodiversity in development planning and no clear mitigation hierarchy.
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Tradition Local Communities	Article 366 (25) of the Constitution of India Article 244(1) of Constitution of India - The Fifth Schedule under Article 244(1) of a subsequent Act of Constitution "Scheduled Areas" as such areas as the President may by order declare to be Scheduled Areas after consultation with Governor of that State. Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 Panchayats (Extension to the Scheduled Areas) Act, 1996	While PESA Act requires clear communities' acceptance vide a Gram Sabha resolution on the proposed activity with a pre-defined quorum of participation, ESS 7 requires ascertaining Free Prior and Informed Consent under three circumstances – impacts on land, cultural heritage and if requiring relocation. FPIC does not require unanimity and may be achieved even when individuals or groups within Indigenous Peoples/groups explicitly disagree. Hence, in such cases both Gram Sabha resolution and FPIC under these three circumstances will be required. However, project implementation area does not include any indigenous peoples.
ESS 8: Cultural Heritage	Ancient Monuments and Archaeological Sites and Remains Act, 1958	Provisions from the act meet the ESS 8 requirements. However intangible cultural heritage aspects will be addressed under ESMP where applicable

ESS	Equivalent National Environmental and Social Policy and Regulations	Policy Gaps vs ESS and gap filling (redressal) Measures
ESS 9: Financial Intermediaries	SEBI ESG Debt Framework (2025) SEBI BRSR & ESG Reporting (2023–2024) RBI Green Deposits Framework (2023) MCA ESG Governance Reforms (2024–25)	There is no direct Indian statute which mirrors ESS 9. The regulation occurs via RBI guidelines, RBI Green Deposits Framework (2023) and MCA ESG Governance Reforms (2024–25). RBI Draft Discloser Framework on Climate-Related Financial Risk (2024) mandates, banks and NBFCs to disclose governance strategy, risk management and matrix for climate risks aligning partially with ESS 9's risk integration. This gap can be bridged by developing Environmental and Social Management System (ESMS) consistent with the provisions in ESS 9, covering screening, risk categorization and monitoring.
ESS 10: Stakeholder Engagement and Information Disclosure	Environmental Impact Assessment Notification-2006, 14th Sep-2006, as amended in 2009 and 2013 Right to information Act 2005	There is a provision of public hearing in EIA notification and also RFCTLARR Act 2013 mandates consultations with affected persons. However, the statutory process does not require preparation of a SEP or equivalent document as well as conducting meaningful consultations and information disclosure, that is accessible to all stakeholders. Measures to address the gap include – preparation of SEF and SEP wherein process of stakeholder consultations with all stakeholders – affected, other interested and physically disadvantaged and vulnerable groups who will be identified and engaged by the project; information disclosure that will take place on project activities/developments and feedback sought; and GRM mechanism that shall be put in place for the entire project, are described in detail.

2.5 Generic Approvals / Permits required

Generic Approvals/ Permits required for project implementation are mentioned in the table below:

Table 11: Generic Approvals/ Permits

Sr.no	Approval / Permit	Issuing Authority	Responsibility	Accountability	Timeline
1.	Administrative Approval	Concerned Administrative Department	PIU	PMU	Before bidding
2.	Technical Sanction	Competent Authority of respective Administrative Department	PIU	PMU	Before bidding
3.	Clearance under Environment (Protection) Act, 1986	Appropriate Appraisal Authority	PIU with the assistance of Environmental Consultant	PMU	Before start of the works
4.	Consent To Establish (Stone Crushers, ready mix concrete batching plant, etc.)	Maharashtra Pollution Control Board (MPCB)	Contractor	PIU	Before start of the civil works
5.	Consent To Operate (Stone Crushers, ready mix concrete batching plant, etc.)	Maharashtra Pollution Control Board (MPCB)	Contractor	PIU	Before start of the civil works
6.	Traffic Diversion Management Plan	Concerned Traffic Police Authority	Contractor	PIU	Before start of the civil works
7.	Labour License	Labour Commissioner	Contractor	PIU	Before start of the civil works
8.	Labour Welfare and Camp Compliance	Labour commissioner, ESMP monitoring cell	Contractor	PIU	Before start of the civil works
9.	Tree Cutting	Forest Department / Authority in respective Corporation	Contractor	PIU	Before start of the civil works
10.	Explosive License	District Mining Office	Contractor	PIU	Before start of the works
11.	Quarrying	Mining Officer of the District	Contractor	PIU	Before start of the works
12.	Construction Waste Management Plan	Project Director, ESMP monitoring cell	Contractor	PIU	Before start of the works

Sr.no	Approval / Permit	Issuing Authority	Responsibility	Accountability	Timeline
13.	Certificate of Pollution Under Control (PUC) of all vehicles deployed on site	State Transport Authority	Contractor	PIU	Before start of the civil works

2.6 Subproject specific Statutory Clearances required

The subproject specific statutory clearances required are listed in the table below. This will be reviewed and updated after screening / ESIA reports for all the subprojects are developed.

Table 12: Subproject Specific Approvals/ Permits

Sr.no	Approval / Permit	Issuing Authority
1	**Retrofitting of existing sluice gates and provision of additional spillway to Radhanagari dam.**	
a)	Permission under Wildlife (Protection) Act, 1972	NBWL under MoEFCC

2.7 World Bank Group EHSGs related to MRDP

The World Bank Group EHSGs guide environmental and social risk management in projects like the Maharashtra Resilience Development Program (MRDP). These guidelines help ensure that project activities meet international standards for safety, sustainability, and community impact.

Relevant provisions in Environmental Health Safety Guidelines issued by World Bank Group will be made applicable for MRDP, by making necessary provision in the bidding documents and contractor's ESMP.

Table 13: World Bank Group EHSGs related to MRDP

Category	Relevant EHSGs	Applicability to MRDP
General Guidelines	Environmental, Health, and Safety General Guidelines	Yes
Agriculture	Agribusiness/Food Production	No
Infrastructure	Construction and Decommissioning	Yes
Water and Sanitation	Water and Sanitation	Yes
Energy	Electric Power Transmission and Distribution	No
Waste Management	Waste Management Facilities	Applies to solid waste handling and disposal in project areas
Health Services	Health Care Facilities	Yes. In labour camps.
Transportation	Roads	No
Forestry	Forest Harvesting	No
Livestock	Mammalian Livestock Production	No

3 ENVIRONMENTAL, SOCIAL AND DISASTER BASELINE

This chapter aims to establish a baseline understanding of disaster risks, social and environmental profile, vulnerabilities, and response capacities in the Project area.

3.1 Disaster Profile of Kolhapur & Sangli Districts

Sangli and Kolhapur have faced multiple disasters over the past 20–30 years, with floods being the most severe. The 2019 floods were among the worst, submerging towns and displacing thousands, with similar events in 1995, 1996, 2005, 2006, 2019, 2020.

Droughts are also a recurring challenge, especially in rain-shadow regions, particularly in Atpadi, Kawathe- Mahakal, Jath, and Tasgaon tehsil of Sangli district. The drought of 1972 was the historically most severe drought with other significant events in 2012 and 2016. These droughts, peaking in summer (March–May), severely impact agriculture and water availability. Landslides, though localized to hilly terrains of the Western Ghats, occur during heavy monsoons, with a significant event in 2021. Earthquakes are rare, with only minor tremors recorded. Understanding these patterns is crucial for effective disaster preparedness and mitigation efforts.

Table 14: Summary of Disaster across Kolhapur and Sangli districts

Disaster Type	Historical Occurrences (Last 20–30 Years)	Frequency & Severity	Seasonality
Floods	2019 floods: One of the worst, submerging towns and villages, displacing thousands. Other major floods: 1995, 1996, 2005, 2006, 2020, 2014.	Increasing frequency due to intense rainfall.	Mostly during monsoon (August–October), with peak flooding in July-August.
Droughts	Recurring droughts, especially in rain-shadow areas of Sangli. Major droughts: In recent past 2012, 2016, 1972 drought was most severe.	Moderate to high frequency, affecting agriculture and drinking water supply. Severity varies, with prolonged dry spells causing migration and crop failures.	Peak occurrence in summer (March–May).
Earthquakes	No major earthquakes recorded, but minor tremors have been felt.	Low frequency: no significant impact reported in recent decades.	Unpredictable, though tremors have been recorded sporadically.
Landslides	Reported in hilly areas, particularly in the Western Ghats during heavy monsoons. Major events: 2021.	Moderate frequency but localized in hilly terrains. Severity depends on rainfall intensity and land stability.	Occurs during monsoon (June–September), especially in heavy rainfall years.

3.1.1 Major Disasters

Sangli and Kolhapur districts have experienced several major disasters over the years, with floods being the most devastating. The 2019 flood was among the worst, displacing over 5 lakh people and causing severe damage to infrastructure due to overflowing rivers. Similar floods in 1995, 1996, 2005, 2006 and 2020 also led to significant losses in life, property, and agriculture.

Droughts, such as the 2016 event, resulted in severe water shortages, crop failures, and distress migration. Other disasters include the 1998 landslide in Amba Ghat, and urban flooding in 2023, worsened by poor drainage. These events highlight the need for improved disaster preparedness and climate resilience in the region.

Table 15: Major Disasters across Kolhapur and Sangli

Sr. No.	Year	Disaster (Flood/ Drought/ Land-slide/Other)	Impacted Areas	Impacts (Fatalities/ Injuries/ Loss of Assets)
1	2019	Flood	Sangli, Kolhapur	**215 villages of Kolhapur district and 58 villages of Sangli district were inundated. The affected area is 1567 sq.km and 692 sq.km respectively. 56 deaths, over 5 lakh people displaced, severe damage to roads, bridges, and homes**
2	2021	Flood	Sangli, Kolhapur	**14 deaths, over 3 lakh people affected, damage to agriculture and livestock**
3	2016	Drought	Sangli, Kolhapur	Severe water shortages, crop failure, distress migration of farmers
4	2005	Flood	Sangli, Kolhapur	**39 deaths, 31 injuries, 13 missing, and over 200 villages affected, extensive property and infrastructure damage**
5	2023	Heavy Rainfall & Urban Flooding	Kolhapur	Waterlogging, disruption of transport, property damage
6	1998	Landslide	Kolhapur	Multiple road blockages, minor injuries, damage to vehicles
7	2014	Hailstorm	Sangli, Kolhapur	Crop damage, heavy losses for farmers

3.1.2 Types of Vulnerability

Sangli and Kolhapur districts face multiple vulnerabilities that heighten disaster risks. Physical vulnerabilities include poor infrastructure in flood-prone areas, weak housing, inadequate road networks, and poor drainage, leading to severe waterlogging. Social vulnerabilities affect marginalized groups such as women, children, the elderly, and the differently abled, who lack adequate resources and support during disasters.

Frequent economic disruptions occur due to floods and droughts, impacting agriculture, MSMEs, and supply chains. Environmental factors like deforestation, river encroachments, and soil erosion further increase disaster risks. Additionally, climate change is intensifying extreme weather events, making monsoons unpredictable and droughts more prolonged, necessitating urgent resilience measures.

Table 16: Vulnerability in Kolhapur and Sangli region

Vulnerability Type	Key Issues
Physical Vulnerabilities	Peculiar topography, flat riverbed slopes, river meanders, series of river confluences, in short reach.
Social Vulnerabilities	Marginalized communities, including women, children, elderly, and differently abled individuals, face higher risks due to lack of resources and support.
Economic Vulnerabilities	Recurring floods and droughts cause significant losses in agriculture and MSMEs, disrupting supply chains and economic stability.
Environmental Vulnerabilities	Deforestation, river encroachments, and soil erosion exacerbate disaster risks, making areas more prone to flooding and land degradation.
Climate Change Impacts	Due to climate change, frequency of cyclonic storms over the Arabian sea has increased. (In the 2019, on Arabian sea 5 cyclonic storms were triggered against long term of average of one per year).

3.1.3 Existing Disaster Management Capabilities of Sangli & Kolhapur

Sangli and Kolhapur have established disaster management capacities, but gaps remain. The institutional framework includes State Disaster Response Force (SDRF), District Disaster Management Authority (DDMA), and National Disaster Response Force (NDRF), with district administration playing a key role; however, coordination challenges persist. Early warning systems exist but need real-time accuracy, while flood forecasting and drainage infrastructure require upgrades.

Community preparedness relies on NGOs and local groups, yet more capacity-building initiatives are essential for effective disaster risk reduction. Recovery efforts have been slow, with gaps in compensation, rehabilitation, and long-term resilience planning, highlighting the need for a more proactive and integrated disaster management approach.

Table 17: Key measures and gaps

Component	Key Measures & Gaps
Natural Drainage System	**Over the years due to man-made interventions, the natural discharge carrying capacity of the drains and rivers drastically reduced. Rejuvenation of natural drainage systems and restoration of river capacity is needed.**
Institutional Framework	Presence of SDRF, DDMA, and NDRF in the region, but coordination challenges exist and there is a scope for improvement. District administration plays a crucial role in disaster response.
Infrastructure & Early Warning Systems	Some early warning systems are in place but lack real-time accuracy. They have become technologically obsolete and need updating. Flood forecasting and drainage infrastructure need improvement.
Community Preparedness & Local Response Mechanisms	NGOs and local groups play a role in disaster response, but more capacity-building initiatives are needed for effective risk reduction.
Past Disaster Response & Recovery Efforts	Post-disaster recovery has been slow, with gaps in compensation, rehabilitation, and long-term resilience planning.

3.2 Socio-Economic Indicators for Sangli and Kolhapur[5]

Table 18: Socio-Economic Indicators for Sangli and Kolhapur District

Sr. No	Indicator	Maharashtra State	Sangli District	Kolhapur District
Geographic Indicators				
1	Geographical Area ('000 sq. km)	308	8.6	7.2
2	% of Urban Population	45.2	25.5	31.7
3	% of Forest Area to total geographical area	20.12	6.4	22.7
4	Forest Area (‘000 sq.km)	61.96	0.55	1.63
Demographic Indicators				
5	Population (Lakh)	1123.74	28.2	27.6
6	Density of Population (per sq. km)	365	329	504
7	Sex Ratio	929	966	957
8	Child Sex Ratio (0–6 years)	894	867	863
9	Literacy Percentage (Rural)	77.0	79.8	78.4
Agricultural Indicators				
10	Annual Rainfall (mm.)	1089.1	363.2	1519.4
11	Percentage of net sown area to geographical area	53.09	70.0	56.3
12	Percentage of total area under foodgrain to total gross cropped area	43.73	31.4	19.6
13	Per capita foodgrain production (kg) (Cereal and Pulses)	131.2	91.7	92.1
14	Cropping intensity (%)	153.9	140.3	156.7
15	Average size of operational holdings (ha)	1.23	1.2	0.7
Socio-Economic Indicators				
16	Number of Schools per lakh population	118	96	86
17	Per capita domestic consumption of electricity (kWh)	310.8	159.5	171.1
18	Per capita industrial consumption of electricity (kWh)	557.8	275.1	949.6
19	Number of establishments per lakh population	5462	9,611	14,341
20	Employment in establishments per lakh population	12, 910	19,559	27,620
21	Per capita income at current prices	2,78,681	2,58,557	2,82,297
22	Factories in operation (no.)	20,739	388	1,167
23	Workers (no.)	83,00,000	24,665	77,332
24	Total Road Length per 100 sq.km (Km)	NA	106	105

[5] Economic Survey of Maharashtra Report (2024–25)

3.2.1 District Profile

3.2.1.1 Kolhapur

Kolhapur, located in the southern part of Maharashtra, is a historically and culturally rich district known for its diverse economic activities and fertile agricultural land. The district spans an area of approximately 7,200 sq. km and as per the 2011 Census, has a population of around 38.76 lakh. It is bordered by Sangli district in the east, Sindhudurg and Ratnagiri in the west, Satara in the north, and Belgaum district of Karnataka in the south. Kolhapur lies between 15°43' to 17°17' North latitude and 73°40' to 74°42' East longitude. The district is predominantly drained by the Panchganga River, along with its 3 tributaries viz., Bhogawati, Tulsi, Kasari, Kumbi and Dhamanu which play a crucial role in irrigation and water supply.

Kolhapur is endowed with rich natural resources, including fertile black and red soils that are well-suited for agriculture. The district has significant deposits of bauxite, making it an important center for mineral-based industries. The Sahyadri mountain range influences the region's climate, providing a favorable environment for agriculture. The topography of Kolhapur is diverse, ranging from the hilly terrains of the Western Ghats to the fertile plains of the Panchganga River Basin. The eastern region of the district is more arid compared to the western part, which receives higher rainfall and supports dense vegetation.

Agriculture is the backbone of Kolhapur's economy, with sugarcane being the dominant crop due to the district's well-developed irrigation infrastructure. Paddy is another major crop that grown extensively in the region of intense rainfall. Besides sugarcane and paddy, crops such as maize, sorghum, soybean, and vegetables contribute significantly to the district's agricultural output. Kolhapur is also known for its thriving dairy industry, with milk production and processing playing a key role in the rural economy. **The district has a strong cooperative movement, particularly in the sugar and dairy sectors, which has led to rural prosperity and economic stability.**

Kolhapur district is administratively divided into 12 talukas, with numerous villages and Gram Panchayats supporting rural development. The land utilization pattern in the district reflects a balance between agriculture, forest cover, and industrial areas. The district is self-sufficient in food grain and vegetable production, catering to both local consumption and external markets. The presence of a well-connected road and rail network enhances trade and commerce, making Kolhapur an important economic hub in Maharashtra. With its strong agricultural base, industrial development, and cultural heritage, Kolhapur continues to play a vital role in the socio-economic growth of the state.

Table 19: Land Utilization Pattern of Kolhapur District

Sr. No	Particulars	Area (Ha)
1	Geographical Area	7,76,300
2	Forest	1,47,200
3	Area under Non-Agricultural use	36,400
4	Permanent Pasture	41,600
5	Area under Fruit Crops, Misc. Tree crops and others	6,400
6	Culturable Waste Land	36,400
7	Fallow other than Current Fallow	24,600
8	Current Fallow	12,600

Sr. No	Particulars	Area (Ha)
9	Cultivable	4,27,000
10	Barren land	44,100

3.2.1.2 Sangli

Sangli district, located in the western part of Maharashtra, is known for its rich agricultural covering an area of approximately 8,572 sq. km. The district had a population of around 28.2 lakh as per the 2011 Census. Sangli is bordered by North-Satara, East- Solapur, South- Belgaon & Vijaypur district of Karnataka, West – Kolhapur. Geographically, the district lies between 16° to 17° North latitude and 73° to 75° East longitude. The Krishna River, along with its tributaries such as the Warna, Yerla, and Agrani, plays a crucial role in irrigating the fertile lands of Sangli, making it one of Maharashtra's leading agricultural districts.

Sangli's topography is characterized by plains and gentle undulations, with the western part featuring the Sahyadri foothills, while the central and eastern regions consist of fertile black soil suitable for intensive farming. The district experiences a semi-arid climate with an average annual rainfall of around 500-600 mm, largely influenced by the southwest monsoon. The soils in the district range from deep black cotton soil in the river basin areas to lighter, well-drained soils in the uplands. While the black soil retains moisture and is suitable for crops like sugarcane and wheat, the upland areas are more suited for dryland farming of sorghum and pulses.

Agriculture is the backbone of Sangli's economy, with sugarcane cultivation being the most dominant due to the presence of numerous cooperative sugar mills in the region. Other major crops include sorghum, soybean, groundnut, wheat, and turmeric, with Sangli being renowned as the **"Turmeric Capital of India."** The district also has significant horticultural production, including grapes, pomegranates, and bananas, which contribute to its strong agro-export industry. Additionally, dairy farming and poultry rearing are prominent allied activities, enhancing the rural economy.

Sangli district comprises 10 talukas and over 700 villages, with a well-developed irrigation system supported by reservoirs, canals, and lift irrigation projects. However, challenges such as water scarcity in certain talukas, such as Kawathe-Mahankal, Jath, and Atpadi due to erratic rainfall, and groundwater depletion impact agricultural sustainability. Despite these challenges, the district has made significant strides in agro-based industries, cooperative institutions, and market linkages, making it a vital hub for Maharashtra's agrarian economy. Sustainable water management and modern agricultural practices continue to be key areas of focus to ensure long-term growth and prosperity in the district.

Table 20: Land Utilization Pattern of Sangli District

Sr. No	Particulars	Area (Ha)
1	Geographical Area	8,61,000
2	Forest	45,100
3	Barren and uncultivable land	38,800
4	Area under Non-Agricultural use	36,400
5	Land under Misc. trees and gravel	12,900
6	Culturable Waste Land	14,600
7	Fallow other than Current Fallow	51,800

8	Current Fallow	38,500
9	Net Area Cultivated	5,95,600

Source: Agriculture Contingency Plan of Sangli District

3.2.1.3 Ichalkaranji

Ichalkaranji, located in the Kolhapur district of southern Maharashtra, is a prominent industrial town known as the "Manchester of Maharashtra" due to its thriving textile industry. Situated approximately 28 km from Kolhapur city, Ichalkaranji has emerged as a major hub for weaving and yarn production, generating over ₹31,300 crore annually from textile exports.

Geographically, Ichalkaranji lies at 16.69°N latitude and 74.46°E longitude and is influenced by a tropical wet and dry (savanna) climate. The average annual temperature is 28.24°C, with peak summer temperatures reaching up to 39.27°C in April. The town receives an average annual rainfall of 81.06 mm, with the wettest months being June to September. The Panchganga River flows through the region, supporting agriculture and water needs.

The town also contributes significantly to sugarcane production, with an estimated annual business of ₹1,300 crore. As per the 2011 Census, Ichalkaranji has a population of around 2.87 lakh, with a sex ratio of 925 females per 1,000 males. The region is linguistically diverse, with Marathi, Hindi, Kannada, and English commonly spoken.

3.3 Environmental Baseline

3.3.1 Temperature

The temperature trends in Kolhapur and Sangli exhibit similar seasonal variations, with slight differences in minimum and maximum temperatures.

Table 21: Annual Temperature variations in Kolhapur and Sangli

	Kolhapur			Sangli		
Month	**Minimum (°C)**	**Maximum (°C)**	**Average (°C)**	**Minimum (°C)**	**Maximum (°C)**	**Average (°C)**
January	13.7	30.1	21.8	12.7	29.6	21.2
February	13.3	32.4	23.4	13.0	31.9	22.9
March	19.3	35.1	26.5	18.6	35.1	26.3
April	21.7	36.2	28.6	21.4	37.1	28.7
May	24.2	38.0	28.8	23.6	39.1	29.1
June	21.4	32.3	24.9	20.8	31.8	24.6
July	21.7	27.9	23.9	21.2	28.0	23.6
August	21.1	27.1	23.5	20.7	27.1	23.2
September	20.6	30.6	24.3	20.0	30.8	24.0
October	18.0	31.7	25.5	17.3	31.2	24.9
November	16.7	30.7	24.3	15.5	30.4	23.5
December	12.8	29.4	21.5	11.5	28.7	20.7

3.3.2 Rainfall

Analysis of past records (1951 - 2019) indicates that average monsoon rainfall in Kolhapur district is 1700 mm and that in Sangli district is 480 mm. In comparison to this, in 2019 rainfall in Kolhapur and Sangli was 2770 mm and 1100 mm.[6] respectively.

[6] Chapter 4.1 - IMD & IITM Report on floods 2019, by Expert Committee Report.

3.3.3 Soil Type

Physiographically, Kolhapur district can be divided into three broad soil zones: (*a*) the western part, with heavy rainfall (is mountainous and woody and is covered with lateritic soils); (*b*) the fertile central part, with brownish well-drained soils of neutral reaction; and (*c*) the dry eastern zone, with precarious rainfall and covered with medium black soil of varying depth.

Table 22: Project district wise major soil class and area coverage

Sr. No.	District	Major Soil Classes	Area ('000 ha)
1	Kolhapur	Lateritic Soil	172.4
		Brown Soil	151.5
		Medium & Deep Black Soil	102.9
2	Sangli	Shallow black/Red soils	389.4
		Deep black soils	142.7
		Medium deep black soils	63.4

Source: Agriculture Contingency plan

3.3.4 Soil Degradation

In Kolhapur district, soil degradation is primarily driven by water-induced erosion and chemical deterioration, particularly salinization. The fine-grained black soils in the eastern region are highly susceptible to salt accumulation due to excessive irrigation, mainly for water-intensive crops like sugarcane. Studies suggest that a single sugarcane harvest can increase soil salinity by 20 to 25 tons per hectare, significantly reducing land productivity. Additionally, waterlogging and frequent flooding during the monsoon contribute to topsoil erosion, further deteriorating soil health. Heavy rainfall exacerbates these issues, leading to crop damage and declining soil fertility over time.

Similarly, in Sangli district, soil degradation is influenced by both natural and human-induced factors. The hilly western regions, covered with laterite soil, experience erosion due to deforestation and improper land use. In contrast, the fertile plains of the central and eastern regions face salinity and alkalinity issues, mainly due to excessive irrigation for commercial crops like sugarcane. Poor drainage systems lead to water stagnation, accelerating the degradation process. Moreover, the presence of hard murum in some areas affects water retention, making the soil less suitable for sustainable agriculture. Addressing these challenges requires improved irrigation practices, soil conservation measures, and sustainable land management to preserve long-term agricultural productivity in both districts.

3.3.5 Soil Drainage and Water Logging

Kolhapur

Kolhapur district features a diverse topography ranging from the hilly terrains of the Western Ghats to the fertile plains of the Krishna Basin. The soils are predominantly medium black and deep black, with good natural drainage in elevated areas. However, low-lying regions and river basins, especially near the Panchganga, Dudhaganga, and Vedganga rivers, are prone to seasonal water logging, particularly during the monsoon. The Deccan basalt formations influence groundwater movement, with shallow aquifers showing water levels between 0.90 to 15.0 mbgl pre-monsoon and 0.10 to 11.10 mbgl post-monsoon. Poor drainage in certain pockets leads to temporary saturation, affecting crop productivity and necessitating improved surface and subsurface drainage systems.

Sangli

Sangli district is characterized by medium to deep black soils and lateritic soils, which vary in drainage capacity depending on the terrain. The Krishna River and its tributaries contribute to localized water logging, especially in areas with Vertisols under intensive sugarcane cultivation. Studies have shown that subsurface drainage systems, particularly with closely spaced and deeper drains (30–40 m spacing and 1.2 m depth), significantly improve soil hydrological properties and reduce water logging. Despite generally moderate drainage, seasonal water saturation remains a challenge in irrigated zones, requiring strategic interventions like drainage design optimization and crop rotation.

3.3.6 Waterlogging and Drainage Conditions

Kolhapur District

The district is drained by rivers like Panchganga, Dudhaganga, and Vedganga, which contribute to seasonal waterlogging in low-lying areas. The soil is predominantly medium to deep black soil which has moderate to poor drainage in flat and basin areas. During the monsoon, water levels in shallow aquifers rise significantly, from 0.90 to 15.0 mbgl pre-monsoon to 0.10 to 11.10 mbgl post-monsoon, leading to temporary saturation and waterlogging in agricultural fields.

The Deccan basalt formations influence groundwater movement, and the presence of weathered and fractured basalt layers creates semi-confined aquifers. Poor drainage in certain pockets, especially near riverbanks and irrigation command areas, affects crop productivity. Surface and subsurface drainage systems, along with contour bunding and check dams, are recommended to mitigate waterlogging and improve soil aeration.

Sangli District

Sangli lies in the Deccan Plateau, with a geomorphology dominated by highly dissected plateaus and Vertisols—deep black soils with high clay content. These soils are prone to water retention, especially under intensive irrigation for crops like sugarcane. Waterlogging is a significant issue in talukas like Miraj and Kavthe Mahankal, where subsurface drainage experiments have shown that closely spaced drains (30–40 m) at depths of 1.2 m can significantly improve hydrological properties. The Krishna River system and its tributaries contribute to seasonal flooding and saturation in low-lying areas. Poor infiltration and slow percolation rates in Vertisols exacerbate waterlogging, especially during monsoon. Aquifer management plans suggest recharge structures, drainage optimization, and crop diversification to reduce waterlogging and improve soil health.

3.3.7 Soil Drainage Classification and Impact on Crop Management

Adverse soil drainage conditions in both Kolhapur and Sangli significantly impact agricultural productivity, primarily due to waterlogging, particularly during the monsoon season. In Kolhapur, the district is classified under "poorly drained" and "imperfectly drained" soil classes, making it highly susceptible to waterlogging. The soil becomes saturated when excess rainfall or a high-water table inundates the root zone for prolonged periods. This condition leads to poor aeration, which hampers plant growth, reduces soil fertility, and lowers crop yields. Similarly, in Sangli, the situation is comparable, with the district also facing significant drainage challenges. Both districts are part of approximately 12% of Maharashtra's geographical area that is affected by waterlogging, leading to severe agricultural and infrastructural consequences.

In Kolhapur, waterlogging is exacerbated by heavy monsoon rainfall, which results in the submergence of low-lying areas. Extreme rainfall events and flooding further aggravate the problem, leading to widespread damage to crops and agricultural infrastructure. The major rivers in Kolhapur, including the Panchganga, Dudhganga, Warna, and Vedganga, receive substantial runoff from the

Western Ghats, resulting in high discharge levels during the monsoon. **These rivers frequently overflow their banks, causing widespread flooding and soil erosion. The main drainage channels in the flood-prone blocks of Shirol, Hatkanangale, and Karveer are not fully capable of handling the volume of floodwater, as many have been silted up, reducing their discharge capacity by 20%-30%. The floodplain of the Panchganga River, in particular, is highly vulnerable, with breaches in embankments and inadequate drainage infrastructure further contributing to the waterlogging issue.**

Table 23: Soils under Limiting Water-Logging Classes

District	AERS (No.)	Class	Moderate
Kolhapur	Hot Moist Sub-humid (19.1)	Slight	Warm Per humid (18.3)
Kolhapur, Sangli	Hot Per humid (18.5)	Moderate	Hot Moist Sub-humid (19.1)

Source: State of Environment Report, Maharashtra.

In Sangli, waterlogging and flooding are similarly problematic, especially in the low-lying areas of the district. **The Krishna, Warna, and Yerla rivers contribute significantly to the waterlogging issue, as they experience high discharge levels during heavy rainfall. The most flood-prone talukas in Sangli include Walwa, Palus, and Miraj,** where the drainage congestion exacerbates the situation. The siltation of local drainage channels has led to a 15%-25% reduction in water flow efficiency, further aggravating waterlogging conditions. The Krishna River floodplain is particularly vulnerable due to breaches in embankments and insufficient drainage infrastructure. This persistent waterlogging problem not only affects farmlands but also damages settlements and infrastructure, making it a critical issue for sustainable agricultural and land management in both districts. Addressing these challenges requires significant improvements in drainage systems, embankment fortifications, and better water management practices to mitigate the impact of waterlogging in Kolhapur and Sangli.

3.3.8 Water Erosion

In both Kolhapur and Sangli districts, water erosion plays a significant role in soil degradation. In Kolhapur, the hilly western areas, especially in the Sahyadri ranges, they experience severe water erosion due to high rainfall and steep slopes, while the central and eastern parts face moderate erosion. Similarly, in Sangli, the hilly western regions and the riverbanks are prone to erosion during heavy rainfall, exacerbating soil loss. To combat water erosion, both districts require effective soil conservation practices, watershed management, and afforestation initiatives to reduce soil degradation and protect agricultural land.

3.3.9 Floods

Sangli and Kolhapur districts are highly vulnerable to seasonal flooding, particularly during the monsoon, due to their proximity to major rivers such as the Krishna, Panchganga, Warna, and Vedganga. The Western Ghats' heavy rainfall, poor drainage in some areas, and excessive discharge from upstream reservoirs contribute to recurrent flood hazards in these districts.

In Kolhapur, the Panchganga river basin, including areas around Shiroli, Shirol, and Ichalkaranji, experiences frequent inundation, with floodwater reaching 1 to 2 meters in depth, affecting agricultural lands, villages, and urban settlements. Encroachments along riverbanks, heavy siltation, and reduced carrying capacity of the river channels worsen the flood situation.

In Sangli, the Krishna River basin, particularly in Miraj, Palus, and Walwa talukas, is chronically flooded. The region witnessed major flooding in 2005, 2019, and 2021, causing extensive damage to farmlands, homes, roads, and critical infrastructure.

The flood event of 2019 was of the order of a 100-year recurrent flood and can be considered as a baseline flood for designing the protection system and evaluating its effectiveness. During the 2019 flood events[7] A large area of Sangli and Kolhapur districts was flooded

The taluka wise details are tabulated in Table 26 below:

Table 24: Taluka wise details of floods in Kolhapur and Sangli Districts

Taluka	Nos. of Affected Villages	Total Village Area (Sq.kms)	Area Under Inundation (Sq.kms)	Inundated area in %
Kolhapur District				
Ajra	1	3.83	0.58	15.08
Bhudargad	4	19.75	1.74	8.81
Gadhinglaj	23	156.84	7.64	4.87
Hatkanangle	27	316.95	66.78	21.07
Kagal	34	226.85	22.46	9.90
Karvir	56	318.28	56.70	17.81
Panhala	20	74.36	6.64	8.93
Radhanagari	6	26.86	0.88	3.26
Shirol	44	423.49	168.90	39.88
Grand Total	215	1567.21	332.30	129.61
Sangli District				
Miraj	20	323.56	76.88	23.76
Palus	17	141.37	15.07	10.66
Walwa	21	227.39	13.10	5.76
Grand Total	58	692.33	105.05	40.18

3.3.10 Ecological Profile

3.3.10.1 Ecological profile of Kolhapur

Kolhapur district, located in the southern part of Maharashtra, boasts a diverse ecological landscape shaped by its location on the fringe of Western Ghats. Dajipur Wildlife Sanctuary is located on western boundary of the district. It is a home for various wildlife species, including Bison, deer, leopards, tigers, wild boar, and different bird species.

Radhanagari dam (spillway location) is in notified Radhanagari WLS boundaries and hence it attracts the provisions in wildlife (Protection Act in 1972.

However, the WLS is separated from the dam by a water submergence of the dam. As such no wildlife corridors are intercepted by the Project. Furter, the land ownership of proposed work is with Water Resources Department.

In the Kolhapur Municipal Corporation area there are 53 gardens spread across 30 hectors (0.4% of city area), with the maximum gardens in E ward (29). To maintain the green cover of the city, the municipal corporation regularly undertakes tree plantation drives and in the year 2015-16

[7] Maharashtra Remote Sensing Application (MRSAC) Report incorporated in Expert Study Committee Report May 2020

KMC planted around 4845 trees. KMC has also established Tree Authority to regulate various activities pertaining to tree plantations, tree census, developing nurseries, organize exhibitions and extend support for tree plantation drives.

In terms of biodiversity, Kolhapur city is blessed with about 125 species of avi fauna, 27 species of mammals, 22 species of reptiles, 30 species of fishes, 35 species of butterflies and 144 species of trees and shrubs, 30 species of pollinating insects, 22 species of Jassids, 36 species of odonates and so on were reported within and around the city. KMC has established a Biodiversity Monitoring Committee to help map the city's biodiversity and plan measures to conserve the local flora and fauna of the city. The committee shall also develop and maintain biodiversity registers by documenting the traditional indigenous knowledge about the wild edible plants, cultural diversity, species of local cattle, and so on.

Table 25: Ecological Profile of Kolhapur

Sr. No.	Ecological Significant Feature		Availability within Project Area
1.	Elephant corridors		No
2.	Wildlife corridors		Exist in district but far away from Project area.
3.	Meandering rivers		Yes, Kolhapur District
4.	Flood-prone areas		Yes, Kolhapur District
5.	Areas of severe landslides		Yes
6.	River erosion		Yes, Embankment of Panchganga River
7.	Flood embankment		Yes, Embankment of Panchganga River
8.	Eco-sensitive areas/stretches in rivers (including habitats of endangered or vulnerable species)		No (There is not any ecological sensitive area near to the project activity)
9.	Physical cultural properties		To be determined during ESIA
10.	Protected Areas	National Parks	Exist in District but far away from Project area.
		Reserved Forest	Exist in District but far away from Project area.
		RAMSAR sites	No
		Biosphere reserves	No
11.	Unprotected and community forests		No
12.	Forest patches		No
13.	Protected Wetlands		No
14.	Surface water bodies		Yes, Lake water mostly used for domestic purpose

3.3.10.2 Ecological profile of Sangli District

Sangli district has a rich ecological profile, with several significant natural features. The district is home to meandering rivers, such as the Krishna River, which plays a vital role in the local ecosystem. Shirala taluka of Sangli district boasts the Chandoli National Park (31,767 ha), a vital habitat for various species, such as leopards, Bengal tigers, Indian bison, jackals, sloth bears, ratels, and wild dogs.

Sangli district also has man-made Sagareshwar Wildlife Sanctuary (1087 ha) known for its high population of deer including Sambar Deer, Blackbucks, Muntjac, Chital, harbors wild boar, peacocks, and small carnivores like hyenas, foxes, and porcupines.

Further, in Satara district, near to boundary of Sangli district there exist an enchanting Mayani Bird Sanctuary, where over 400 bird's species have found their home.

However, all these locations are far away from the Project site. The Project will not intercept any wildlife corridor.

Sangli also has surface water bodies, mainly lakes, which are primarily used for domestic purposes. Although the district does not have any officially designated protected wetlands or forest patches, the riverbanks and surrounding areas contribute to the region's biodiversity. The area also faces river erosion, especially along the embankments of the Krishna River, which necessitates regular maintenance and protection efforts. Despite the lack of major protected natural areas, the district's ecological features, including water resources and river systems, are vital for sustaining its biodiversity and providing critical ecosystem services to the local communities.

Table 26: Ecological profile of Sangli District

Sr. No.	Ecological Significant Feature		Availability within Project Area
1.	Elephant corridors		No
2.	Wildlife corridors		Exist in District but far away from Project area.
3.	Meandering rivers		Yes, Sangli District
4.	Flood-prone areas		Yes, Sangli District
5.	Areas of severe landslides		No
6.	River erosion		Yes, Embankment of Krishna River
7.	Flood embankment		Yes, Embankment of Krishna River
8.	Eco-sensitive areas/stretches in rivers (including habitats of endangered or vulnerable species)		No (There is no any ecological sensitive area near to the project activity)
9.	Physical cultural properties		To be determined during ESIA
10.	Protected Areas	It exists in District but far away from Project area.	Exist in District but far away from Project area.
		It exists in District but far away from Project area.	Exist in District but far away from Project area.
		No	No
		No	No
11.	Unprotected and community forests		No
12.	Forest patches		No
13.	Protected Wetlands		No
14.	Surface water bodies		Yes, Lake water mostly used for domestic purpose

3.3.11 District Wise Biodiversity Profile

3.3.11.1 Kolhapur

Kolhapur is blessed with diverse biodiversity particularly in western ghat region of the district due to the presence of several habitats in and around the city. Around 125 species of avi fauna, 27 species of mammals, 22 species of reptiles, 30 species of fishes, 35 species of butterflies and 144 species of trees and shrubs were reported within and around the city. A total of 30 species of pollinating insects belonging to the five orders viz. Hymenoptera, Lepidoptera, Diptera, Coleoptera and Thysanoptera have been reported from the Kolhapur region. Further, 22 species of Jassids belonging to the genera Deltocephalus, Empoasca, Nilaparvata, Nephotettix, Recilia, Cofta and Typhlocyba from the agriculture areas present around the city. Also, 36 species of odonates have been reported from the paddy ecosystem present in the Kolhapur district belonging to the genera, Crocothemes, Pantala, Anax, Neurothemis, Ichneura[3] etc. Insect species such as Orthopteroids, Scarab beetles, mosquitos and so on have also been studied in the Kolhapur region.

3.3.11.2 Sangli

Sangli, situated in the Western Ghats region, is endowed with rich biodiversity due to its varied habitats, particularly around its river systems and agricultural areas. The district is home to a variety of wildlife, including several species of birds, mammals, reptiles, and insects. While the exact number of species is not as extensively documented as in Kolhapur, the district's ecosystem supports numerous species of avi fauna, butterflies, and other pollinators. Additionally, the agricultural areas around Sangli have been identified as habitats for several species of Jassids, which are important for studying pest dynamics in crops. The Krishna River and its tributaries provide essential habitats for aquatic species, and the region's paddy ecosystems support various odonate species.

Insects such as Orthopteroids, beetles, and mosquitoes are also common in Sangli's diverse ecosystems. The region's biodiversity is influenced by its natural topography, including the riverbanks, floodplains, and agricultural landscapes. Despite the absence of extensive surveys like in Kolhapur, Sangli's flora and fauna contribute significantly to its local ecology and the surrounding rural livelihoods. The district's biodiversity, especially within its agricultural zones, is integral to maintaining ecological balance and supporting sustainable agricultural practices.

3.3.12 Agriculture

3.3.12.1 Operational Holding

The land holding pattern in Kolhapur and Sangli districts shows a significant proportion of marginal and small farmers.

Table 27: Kolhapur district wise land holding status

District	Item	Classification of Holding	<= 1 Ha	> 1 to <= 2 Ha	>2 Ha	Total
Kolhapur	Holding (Nos.)	Nos.	504117	105492	51067	660676
		% to Total	76.30	15.97	7.73	100.00
	Area (Ha.)	Ha.	168114	128903	191006	488023
		% to Total	34.45	26.14	39.14	100.00
Sangli	Holding (Nos.)	Nos.	459872	98265	45192	603329
		% to Total	76.32	16.30	7.48	100.00
	Area (Ha.)	Ha.	149862	120284	218877	488023

District	Item	Classification of Holding	<= 1 Ha	> 1 to <= 2 Ha	>2 Ha	Total
		% to Total	30.72	24.67	44.83	100.00

Source: Agriculture Census 2015

3.3.12.2 Agricultural Crops

The Sangli district is renowned as the **"Sugar Bowl of India"** due to high sugar cane productivity and is also the **largest Turmeric trading hub in Asia**.

In Kolhapur district also sugarcane is the predominant crop. Rice, Sorghum are also significant crops.

Farmers in Kolhapur cultivate a wide range of crops across different seasons, with paddy standing out as the most prominent. The district also grows sorghum, maize, and sugarcane, contributing to its diverse agricultural landscape. In Sangli, the farming community grows a variety of crops, including sorghum, soyabean, sugarcane, and ground nut, with sorghum being a key crop. These regions benefit from a rich variety of crops that thrive in the respective seasons, supporting the agricultural economy. The area covered under various crops in each season is outlined below:

Table 28: Crops Grown and Area under Different Crops

District	Crop Type	Kharif (Area in Ha) Total	Rabi (Area in Ha) Total
Kolhapur	Sugarcane (Irrigated)	-	1,13,900
	Paddy	1,13,800	-
	Sorghum	8,700	12,700
	Maize	2,800	7,400
Sangli	Sorghum	1,02,800	1,53,200
	Soyabean	82,600	-
	Sugarcane (Irrigated)	55,700	-
	Groundnut	32100	-
	Wheat	-	30600

Source: ICAR: Agriculture Contingency Plan

3.3.13 Agro-Chemical Use

3.3.13.1 Pesticides

Focus Group Discussions (FGD) were conducted with farmers in the project districts of Kolhapur and Sangli to understand the types of pesticides they commonly use. The discussions revealed that farmers typically use pesticides as recommended by local agrochemical shops. Additionally, many farmers follow recommendations from fellow farmers in the locality for specific crops. This sharing of knowledge, both through farmer-to-farmer exchanges and advice from agrochemical shops, plays a crucial role in the pesticide selection process. Most farmers buy pesticides based on the type of infection or disease affecting their crops. The pesticide consumption figures for both Kolhapur and Sangli districts are presented in the tables below for the year 2012.

Table 29: Pesticide Consumption of year 2012

District	Pesticides Consumed (MT)
Kolhapur	94,831
Sangli	1,10,890

- **Key Pests and Vulnerable Crops**

The project districts, Kolhapur and Sangli, are predominantly agricultural, with a focus on crops like sugarcane, paddy, sorghum, maize, soyabean, and groundnut. Pest attacks are common during the agricultural season, affecting various crops. The following table summarizes the key pests observed in these districts by crop type:

Table 30: Key Pests by Crop Categories in Project Districts

District	Crop Type	Key Pests
Kolhapur	Paddy	Rice leaf Folder, Yellow stem borer, striped stem borer, Army worm
	Sugarcane	Shoot borer, White grub, Root borer, Sugarcane top shoot borer
	Sorghum	Shoot fly, Stem borer, Jassids, Leafhoppers
	Maize	Maize stem borer, Fall armyworm, Rootworms, Leafhoppers
Sangli	Sorghum	Shoot fly, Stem borer, Jassids, Leafhoppers
	Soyabean	Pod borer, Leaf miner, Whitefly, Spodoptera (Cotton caterpillar)
	Sugarcane	Shoot borer, White grub, Root borer, Sugarcane top shoot bore
	Groundnut	Termites, Root rot, Leaf spot, Pod borer
	Wheat	

- **Commonly Used Pesticides and their WHO Classification in Kolhapur and Sangli Districts:**

Farmers in Kolhapur and Sangli districts commonly use various pesticides to manage pests and diseases affecting their crops. These pesticides are generally procured from local agrochemical outlets, where the type of disease or pest is explained, and the appropriate pesticide is recommended. The table below presents the commonly used pesticides in these districts and their corresponding WHO classification:

Table 31: Pesticides in Use by the Farmers in Kolhapur and Sangli Districts

Sr. No.	Chemical Pesticide	WHO Class
1	Endosulfan	II
2	Malathion	III
3	Carbaryl	II
4	Dimethoate	II
5	Copper Oxychloride	U

Note: Class Ia: Extremely hazardous, **Class Ib**: Highly hazardous, **Class II**: Moderately hazardous, **Class III**: Slightly hazardous, **Class U**: Unlikely to present acute hazard

3.3.13.2 Fertilizers

Soil Fertility and Fertilizer Usage in Kolhapur and Sangli Districts

Soil fertility is influenced by the presence of essential nutrients like nitrogen, phosphorus, and potassium, which play a crucial role in determining fertilizer application and seed selection for optimal crop productivity. Organic carbon content is an important factor in maintaining soil fertility.

In Kolhapur, soil fertility assessments reveal that a significant portion of the district has medium to high organic carbon content, contributing to better soil health. The soil is neutral to slightly acidic, with certain areas showing Boron and Zinc deficiencies. Nitrogen levels in the soil are generally low to moderate, leading to higher nitrogenous fertilizer usage. However, phosphorus and potassium

application remain moderate due to the presence of these nutrients in sufficient quantities in many parts of the district.

In Sangli, soil analysis shows medium organic carbon levels, with some regions having low organic carbon content. The soil in this district is predominantly neutral, though saline patches exist in some areas. Nitrogen content is low to moderate, necessitating increased nitrogen-based fertilizer application. Phosphorus and potassium levels vary, with some regions requiring supplemental phosphatic and potassic fertilizers to enhance productivity.

The fertilizer use pattern in both districts is influenced by soil conditions, with farmers relying on urea (Nitrogen source), single super phosphate (Phosphorus source), and muriate of potash (Potassium source) to balance soil nutrient requirements and ensure healthy crop growth.

3.3.14 Tourism & Pilgrimage

Kolhapur is an important tourist destination in Maharashtra as there are several temples of high religious importance, places of natural scenic beauty and culturally significant museums and other attractions. The city is visited by thousands of visitors every year.

The city is most famous for the Mahalaxmi temple situated here, which is a famous pilgrim destination and even has references in ancient religious texts. There are a host of other natural and man-made tourist attractions like the Panhala fort and hill station, Rankala Lake, Jyotiba temple, Radhanagari Wildlife sanctuary (Dajipur), ancient Kopeshwar Temple and so on.

Kolhapur features the Radhanagari Wildlife Sanctuary, a UNESCO-recognized natural heritage site, which serves as a vital habitat for the Indian bison (gaur) and numerous bird species. The dense forests, waterfalls, and pristine lakes in the region offer serene eco-tourism experiences. Trekking, birdwatching, and nature trails at places like Panhala and Dajipur add to the district's appeal.

3.4 Socio-economic Baseline

3.4.1 Demographic Profile[8]

Kolhapur district had a population of 3,876,001 (1,980,658 males and 1,895,343 females) in 2011, with current estimates exceeding 4.3 million. In 2011, Kolhapur district had a population of 3.88 million. Children aged 0–14 years made up approximately **24.32%** of the population, reflecting a moderately youthful demographic. The working-age population, defined as individuals between 15 and 59 years, constituted around **57.03%**, indicating a strong labor force base. Meanwhile, the dependent elderly population aged 60 and above accounted for roughly **18.65%**, suggesting a gradually aging trend. This distribution highlights Kolhapur's demographic transition, with a shrinking child population and a growing adult and senior segment, which has implications for healthcare, employment, and social support systems. Around **31.73%** of Kolhapur's population reside in urban areas, while the majority in both districts live in rural settings. Kolhapur's density is 504 persons per square kilometer, reflecting its more compact geography and higher urbanization rate.

As per Census 2011, Sangli district had a population of 2,822,143 (1,435,728 males and 1,386,415 females), with an estimated 2025 population of over 3.1 million. Urbanization levels differ, with **25.49%** of Sangli's population Sangli district, with a population of 2.82 million in 2011, had

[8] Economic Survey Report of Maharashtra (2024-2025),

about **28.21%** of its residents in the 0–14 age group, showing a slightly higher proportion of children compared to Kolhapur. The working-age population (15–59 years) comprised approximately **48.57%**, while the elderly population aged 60 and above made up around **23.22%**. This age structure suggests that Sangli was experiencing a more pronounced demographic shift, with a larger dependent population — both young and old — relative to its working-age base. Such a profile underscores the need for targeted investments in education, elder care, and employment generation. Sangli district has a population density of 329 persons per square kilometer, with urban density much higher due to concentrated settlements. (Census of India, 2011, Sangli District)

As of the most recent estimates, Ichalkaranji, a prominent textile city in Kolhapur district of Maharashtra, has a population of approximately 393,015. The city exhibits a balanced gender distribution, with 203,377 males **(51.7%)** and 189,638 females **(48.3%)**, and a median age of 29.4 years—slightly higher for females (30.5) than males (28.3). The age distribution of Ichalkaranji reveals a youthful and predominantly working-age population. Children aged 0–14 years make up a significant portion, with 29,174 under 5 years, 31,226 between 5–9 years, and 34,773 between 10–14 years, totaling 95,173 individuals, or about 24.2% of the population. The adolescent group (15–19 years) comprises 35,925 individuals, accounting for roughly 9.1%. The working-age population (20–59 years) is the largest demographic segment, totaling 245,064 people, or approximately **62.4%** of the population.

The elderly dependent population (60 years and above) comprises 45,862 individuals, or about **11.7%** of the total. This includes age groups from 60–64 (15,127) to 85+ (2,217), reflecting a gradually aging segment that may require increased healthcare and social support in the coming years

This demographic structure indicates that Ichalkaranji has a strong labor force base, with a growing need to plan for both youth development and elderly care. The data is sourced from City Facts, which compiles demographic statistics from the Center for International Earth Science Information Network (CIESIN) and the European Commission's Joint Research Centre (JRC).

ULB-specific age distribution data for Kolhapur, Sangli-Miraj-Kupwad and Ichalkaranji is not available. However, during the census survey conducted in project influence area of Storm Water Drainage System in Sangli-Miraj-Kupwad municipal corporation, age distribution data of PAPs is gathered which is as below.

Table 32: Age distribution profile of PAPs in SMKMC project influence area

	Age Group	No. of PAPs	Percentage
Age Group composition	0-4	15	3.80
	5-15	57	14.43
	16-30	100	25.32
	31-50	120	30.38
	Above 51	103	26.08
	Total PAPs	**395**	**100**

3.4.2 Social Composition[9]

Kolhapur city, located in western Maharashtra, has a diverse social and religious profile. The Scheduled Caste (SC) population accounts for **13.11%,** while the Scheduled Tribe (ST) population is relatively low at **0.54%**. This scheduled tribe population is concentrated in Jatt and Kautya Mahakal talukas which are far away from the project area. However, each subproject will be screened for affected Scheduled Tribe people. Religiously, Hinduism is the dominant faith, followed by **87.2%** of the population. Muslims makeup **7.39%,** Jains for **4%**, Buddhists for **0.77%**,and Christians for **0.4%.** The city has a high literacy rate of **90.61%,** reflecting a relatively strong socio-economic base. While specific APL/BPL data is not detailed at the city level, district-level surveys suggest that rural Kolhapur has a significant BPL population, especially in flood-prone and agrarian zones. Urban Kolhapur, with better infrastructure and employment opportunities, has a higher concentration of APL households.

Sangli district presents a mixed social composition. The SC population is **12.51%,** and the ST population is **0.65%** Religiously, Hindus form the majority at **86.47%,** followed by Muslims at **8.49%,** Jains at **3.1%,** Buddhists at **1.35%,** and Christians at **0.32%**. The district is predominantly rural, with **74.51%** of the population living in villages. This rural dominance, combined with recurring droughts and floods, contributes to a substantial BPL population, particularly among smallholder farmers and landless laborers. Urban centers like Sangli-Miraj-Kupwad have a relatively higher APL population due to industrial and service sector employment.

Ichalkaranji, a major textile city in Kolhapur district, has a Scheduled Caste (SC) population of **9.08%** and a Scheduled Tribe (ST) population of **0.61%.** The city's religious composition is led by Hindus, who make up **78.32%** of the population, followed by Muslims at **15.98%,** Jains at **4.68%,** Buddhists at **0.45%,** and Christians at **0.25%**. Despite its industrial vibrancy, the 2019 and 2021 floods revealed vulnerabilities among low-income groups, many of whom fall under the BPL category, especially those employed in informal sectors like power looms and daily wage labor. The APL population includes business owners, skilled workers, and professionals.

The data regarding vulnerable people in the ULB areas under MRDP, particularly in project influence area will be mapped during ESIA / census survey.

3.4.2.1 Indigenous People (Scheduled Tribes) in project area in the state

Scheduled Tribes in Maharashtra

Maharashtra has the second largest number of tribal populations in the country. The total tribal population living in the State is estimated to be 10.51 million, which is 9.35 per cent of the total population of the state1. The State is having 50,757 sq. Km under the Tribal Sub-Plan which is 16.52 percent of the total geographical area (3,07,313 Sq. Km) of the State. Main tribes in the State are the Bhills, Gonds, Mahadeo Kolis, Pawras, Thakurs and the Varlis. Three tribes have been notified as Particularly Vulnerable Tribal Groups (PVTGs). These are Kolams (Yavatmal District), the Katkaris (in Thane and Raigad Districts) and the Madia Gonds (Gadchiroli District).

Tribal communities are scattered in thirteen (13) districts of the State and in seventy-three talukas. Tribals are more predominantly in Nandurbar (69.30 percent), Gadchiroli (38.68 percent),

[9] District census handbook for Kolhapur and Sangli District(2011)(censusofindia.gov.in)

Dhule (31.55 percent), Nashik (25.61 percent), Yavatmal (18.54 percent), Chandrapur (17.65 percent), Gondia (16.18 percent), Jalgaon (14.28 percent), Thane (13.95 percent), Amaravati (13.98 percent) and Wardha (11.53 percent) districts. The State has 46 Scheduled Tribes

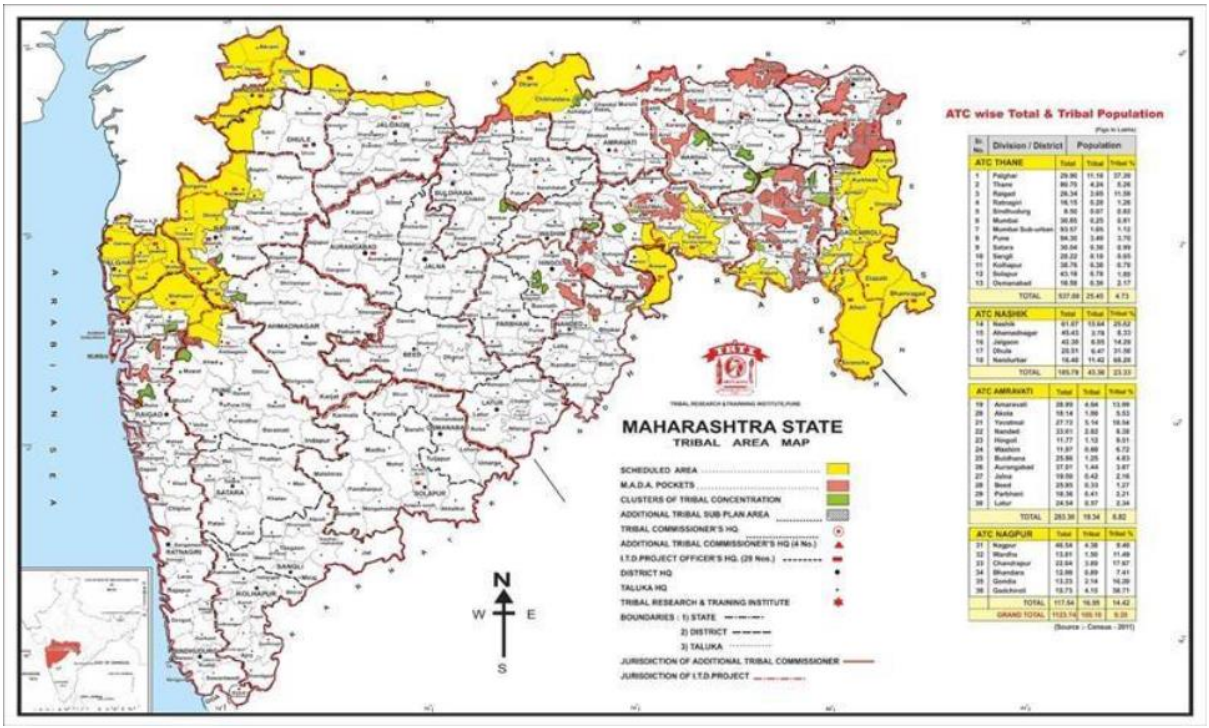

Figure 2: Map of tribal population of state of Maharashtra

Source: https://tribal.maharashtra.gov.in/1017/Map-of-Scheduled-Area?format=print

Schedule Tribe People in MRDP area

Thirteen (13) districts of the State of Maharashtra, having tribal population are included in Schedule V, designated under Article 244 (1), of the constitution of India. **However, Sangli and Kolhapur districts (project impact area) are not included in this Schedule.** As such, Panchayat Extension of Scheduled Area (PESA), Act, 1996, enacted to respect and preserve the traditional tribe governance and customs is also not applicable to the project area.

ESS 7 of the World Bank is typically triggered when the indigenous people have "collective attachments" to the land. In Indian context, ESS 7 is applicable to those areas which are included in Schedule V of the Constitution of India.

Thus, full Indigenous People Policy Framework (IPPF) is not required for MRDP.

While Maharashtra has a tribal population of 10,510,000 people (9.35% of state's total population), Kolhapur's tribal population is 0.77% and Sangili's is 0.64% of their respective district populations. Scheduled Tribes (ST) constitute 0.6% of Ichalkaranji' s population, totaling 1,760 individuals as per 2011 Census. These districts have significantly lower tribal concentrations than the state average of 9.35%. Further, this population is scattered and located in rural areas. However, tribal PAPs if any, will be identified by rigorous screening and the adverse impact if any, will be mitigated through subproject specific ESMPs.

The scheduled tribe populations in Kolhapur and Sangli districts represent small but distinct communities within Maharashtra's diverse demographic landscape. The predominant tribal communities in Kolhapur district belong to the Koli Mahadev and Dongar Koli tribes. The Koli Mahadev tribe is particularly significant, being one of the fifteen tribes in Maharashtra with a population exceeding one lakh (100,000) across the state, with a total population of 1,459,565 as per the 2011 Census. Sangli district has a slightly more diverse tribal composition with four principal tribal groups: Koli Mahadev, Dongar Koli, Pardhi, and Advichincher. The Koli Mahadev and Dongar Koli tribes are common to both Kolhapur and Sangli districts, indicating cultural and historical connections between the tribal populations of these neighbouring districts. The Pardhi tribe, also found in Sangli, is recognized as a distinct scheduled tribe with its own sub-categories including Phans Pardhi, Phanse Pardhi, Langoli Pardhi, Behelia, Behellia, Chita Pardhi, Shikari, and Takankar. In Icchalkaranji, the main tribal communities include Koli Mahadev and Dongar Koli. These tribes are part of Kolhapur district's broader tribal demography

Potential Adverse Impacts and Mitigation Measures

A small percentage of the project affected persons (PAPs) are likely to be STs. These PAPs could be adversely impacted by land acquisition/take required for flood mitigation, storm water upgradation, land slide mitigation and other nature-based infrastructure. While physical displacement and impact on customary tribal land and properties is not expected, ST households could experience partial loss of private land and livelihoods, and construction related disruptions. Project will proactively avoid, minimize and mitigate adverse social impacts related to land acquisition on tribal people. Wherever unavoidable, efforts to minimize impacts through design adaptations will be worked out for sub-projects. Tribal PAPs will be provided with full compensation, allowances and assistance as per the entitlement's matrix.

3.4.3 Literacy and Education[10]

Kolhapur district stands out as one of the most educationally developed regions in Maharashtra. According to the 2011 Census, the district has an overall literacy rate of **81.51%,** which is significantly higher than the national average of **72.98%.** The male literacy rate is **88.57%,** while the female literacy rate is **74.22%.** In urban areas like Kolhapur city, the literacy rate is even higher at **90.61%,** with male literacy at **93.95%** and female literacy at **87.18%** The district benefits from a dense network of educational institutions, especially in tehsils like Karveer, Hatkanangle, Shirol, and Panhala, which show strong educational indicators due to better infrastructure and accessibility However, remote and hilly regions such as Gaganbawda and Chandgad lag behind due to geographical constraints and limited access to schools.

Sangli district also demonstrates a commendable literacy profile. As per the 2011 Census, the overall literacy rate is **81.48%,** with male literacy at **88.22%** and female literacy at **74.59%** Urban areas like Sangli-Miraj-Kupwad show even better performance, with an average literacy rate of **85.91%,** male literacy at **90.02%,** and female literacy at **81.77%**. The district has a strong educational infrastructure, especially in urban centers, but rural areas still face challenges such as gender disparity and limited access to higher education. Literacy rates among religious communities

[10] Economic Survey Report of Maharashtra (2024-2025)

also vary, with Jains having the highest literacy at **91.79%**, followed by Muslims at **84.71%,** Buddhists at **80.92%,** and Hindus at **80.76%**

Ichalkaranji, a prominent textile city in Kolhapur district, has a high literacy rate of **85.98%,** with male literacy at **90.53%** and female literacy at **81.08%.** The city's industrial growth has contributed to its educational development, with many families investing in schooling for their children. Despite its economic vibrancy, the city still faces challenges in educational equity, particularly in slum areas where access to quality education is limited. The presence of multiple communities and a strong tradition of cooperative movements has fostered a culture of learning and vocational training, especially in textile-related fields.

3.4.4 Human Development[11]

Kolhapur district exhibits moderate to high levels of human development across its various tehsils. A study using the Kendall's ranking coefficient method assessed human resource development based on indicators such as literacy, health, and income. Tehsils like Hatkanangale and Shirol, which are physiographically plain and industrially active, show higher HDI scores, while hilly regions like Gaganbawada and Radhanagari lag due to limited access to services and infrastructure. The district benefits from a strong educational network and relatively good healthcare facilities, contributing to its overall human development. However, disparities persist between urban and rural areas, and between different socio-economic groups, indicating the need for targeted development interventions.

Sangli district ranks among the more developed regions in Maharashtra in terms of human development. The literacy rate stands at 82.62%, and the district has a sex ratio of 964 females per 1000 males, reflecting relatively balanced gender demographics. Sangli's HDI is supported by its strong agricultural base, particularly in sugarcane production, and its expanding industrial and educational infrastructure. Urban centers like Sangli-Miraj-Kupwad benefit from better access to healthcare and higher education, while rural areas still face challenges related to drought, water scarcity, and limited healthcare access. The district's development is uneven, with eastern talukas showing better HDI scores due to water projects and infrastructure, while western drought-prone areas require more focused development efforts.

Ichalkararnji[12] presents a mixed picture in terms of human development. While the city is economically vibrant due to its textile industry, the Human Development Index (HDI) for slum dwellers remains low. A detailed study using UNDP's HDI methodology found that the average HDI for slums in Ichalkaranji is 0.49, with some slums like Amarai reaching a high of 0.64, and others like Bhore falling as low as 0.30 The HDI components—life expectancy, education, and income—vary significantly across different neighborhoods. Slum-like settlements (SLS) also show similar HDI levels (average 0.51), indicating widespread socio-economic challenges. Despite industrial growth, access to quality education, healthcare, and income opportunities remain uneven, especially in informal settlements. The study highlights the need for inclusive urban planning and targeted interventions to uplift marginalized communities.

[11] mahasdb.maharashtra.gov.in (2011)
[12] Human development Index of Slum dwellers in Ichalkaranji(iifans.org) Dec.2022)

3.4.5 Economy and Livelihoods[13]

Both Sangli and Kolhapur districts have economies that are fundamentally anchored in agriculture, with sugarcane as a major crop and a large share of the population engaged in farming and allied activities. Kolhapur, known as the "Sugar Bowl of India," also excels in dairy, poultry, and agro-processing, while Sangli is noted for its sugarcane, grapes, and pomegranates, supporting 15 sugar factories and a significant number of people dependent on agriculture. In recent years, both districts have seen increasing diversification into industry and services. Kolhapur's industrial sector includes spinning mills, textile units, over 300 foundries, engineering goods, chemicals, auto-ancillaries, and traditional crafts like Kolhapuri chappals and imitation jewelry. Kolhapur city is witnessing the growing importance of commerce, services, and small-scale industries, with most of the workforce engaged in main employment. Women play a significant role in agricultural labor in both districts. Kolhapur has a rich tradition of freshwater fishing, especially in areas like Radhanagari Tehsil, which is home to rivers such as Dudhganga, Bhogawati, and Tulshi, along with reservoirs like Dudhsagar, Radhanagari, and Tulshi dams.

Sangli's industrial profile features sugar and textile production, handlooms, power looms, medicinal preparations, and rope and tape manufacturing. Sangli is also witnessing the growing importance of commerce, services, and small-scale industries, with most of the workforce engaged in main employment. Women play a significant role in agricultural labor. Kolhapur city is witnessing the growing importance of commerce, services, and small-scale industries, with most of the workforce engaged in main employment. Women play a significant role in agricultural labor in both districts. The MSME sector is expanding, supported by targeted lending and infrastructure development. Overall, while agriculture remains the backbone of livelihoods, the steady growth of industry and services is enhancing economic resilience and contributing to rising incomes across both districts. In Sangli, as well especially in drought-prone eastern talukas like Atpadi, Khanapur, and Tasgaon, (i.e. outside the project area) fishery is practiced in man-made reservoirs such as Bhakuchi Wadi, Nimbavde, and Sidhewadi.

Ichalkaranji is widely recognized as the "Manchester of Maharashtra" due to its thriving textile industry, which forms the backbone of the local economy. The city hosts thousands of power looms, spinning mills, and garment units, providing employment to a large segment of the population. Many families are engaged in small-scale textile production, often operating from home-based units or cooperative setups. This industrial ecosystem supports not only direct employment but also allied services such as transport, dyeing, packaging, and retail. However, the informal nature of much of this work means that job security and social protection are limited for many workers.

Beyond textiles, Ichalkaranji's livelihood landscape includes small-scale trade, construction, auto-repair, and domestic services, which are vital for urban sustenance. Women play a significant role in informal vending, tailoring, and home-based work, though their contributions often go unrecognized in formal economic statistics. While Ichalkaranji is not a coastal city, fisheries still contribute to livelihoods in the broader Kolhapur district through inland aquaculture. Maharashtra ranks 7th in India's fish production, with marine fisheries accounting for 82% and inland fisheries 18%. Inland fish farming is promoted through schemes like the Pradhan Mantri Matsya Sampada Yojana (PMMSY), which supports fish farmers with infrastructure, credit

[13] Kolhapur.gov.in and dcmsme.gov.in

access, and training. Women's participation in fisheries, especially in post-harvest activities like processing and marketing, is growing, though challenges remain in terms of recognition, wage equity, and access to resources

Fishing here is largely artisanal, relying on indigenous techniques passed down through generations. In Sangli and Kolhapur district, the fishing rights irrigation tanks are given by auctions. In Kolhapur and Sangli district fishing rights respectively on 26 & 39 irrigation tanks have been given. There is no significant fishing activity, in MRDP sub-project area including river Krishna and Panchaganga i.e. in project area. However, during the ESIA of river works, fishery baseline information and potential impact if any will be ascertained and mapped.

3.4.6 Gender distribution and sex ratio[14]

As per the 2011 Census, Kolhapur Municipal Corporation had a total population of 549,236, comprising 280,366 males and 268,870 females. This results in a sex ratio of 959 females per 1000 males, which is higher than the Maharashtra state average of 929. The child sex ratio (0–6 years) in Kolhapur city was 845 girls per 1000 boys, slightly below the state average of 894. The relatively balanced gender ratio in Kolhapur city reflects its urban character and access to healthcare and education, although the lower child sex ratio indicates ongoing challenges in gender equity at birth.

In the Sangli Urban Agglomeration, which includes Sangli, Miraj, and Kupwad, the total population in 2011 was 513,961, with 259,320 males and 254,641 females. The sex ratio stood at 982 females per 1000 males, which is significantly above both the national urban average of 926 and the Maharashtra state average. The child sex ratio was 901 girls per 1000 boys, closely aligned with the national urban average. Sangli's favorable sex ratio reflects progressive social indicators and relatively equitable gender distribution in urban settings.

According to the 2011 Census, Ichalkaranji Municipal Council had a population of 287,353, with 149,164 males and 138,189 females, resulting in a sex ratio of 926 females per 1000 males. The child sex ratio was 902 girls per 1000 boys, slightly above the state average of 894. While Ichalkaranji's overall sex ratio is close to the state average, the city still faces gender disparities, particularly in informal employment and access to services among women in lower-income group

3.4.7 Child Labour[15]

Child labour in Kolhapur is notably present in brick kilns, sugarcane harvesting, construction sites, and domestic work. Migrant families from Vidarbha, Marathwada, and neighbouring states often bring children along, who end up working due to economic hardship and lack of schooling access.A 2022–23 survey by Avani NGO found: 450 children working in brick kilns and 1,905 children involved in sugarcane cutting. Children are also seen in hotel kitchens, roadside vending, and household chores, especially in urban slums.

Sangli's child labor is concentrated in agriculture, brick kilns, domestic work, and small-scale manufacturing. The district's drought-prone eastern talukas (e.g., Atpadi, Khanapur) see higher

[14] Economic Survey Report of Maharashtra (2024-2025)

[15] A survey report by AVANI.org and City Facts, demographic statistics from the Center for International Earth Science Information Network (CIESIN) and the European Commission's Joint Research Centre (JRC)

incidence due to poverty and migration. Children often assist in cotton picking, vegetable harvesting, and livestock care.

Child labour in Ichalkaranji remains a pressing concern despite its industrial growth and relatively high literacy rate. The textile industry, which is the backbone of the city's economy, has been identified as a sector where child labour is prevalent, particularly in informal and home-based units. Children, especially from economically disadvantaged families, are often engaged in tasks such as thread cutting, packaging, and loom assistance, which are considered hazardous due to long working hours and poor working conditions.

The Child and Adolescent Labour (Prohibition and Regulation) Act, 1986 prohibits employment of children below 14 years in any occupation and process and adolescence in the age of 14-18 years in hazardous occupations and processes. The provisions in the said Act will be strictly observed during the implementation of MRDP.

To confirm that, child labours are not hired to work on the project, workers will need to provide legally recognized documents such as Citizenship Card or Birth Certificate. Further, awareness raising sessions will be conducted regularly to the communities to sensitize on prohibition and negative impacts of child and forced Labor. However, in practice in some sectors of work there might be the risk of non-compliance. As per the labour act, special work permits need to be taken from Labor Office to use any migrant workers to prevent the risk of child labor.

Necessary provisions is made in the Labour Management Procedures (LMP) and integrated with the contract documents for the civil works.

3.4.8 Community Organizations and Civil Society[16]

Kolhapur has emerged as a model for community-led urban development, particularly through its pioneering work in slum rehabilitation. The Bondrenagar project, under the Pradhan Mantri Awas Yojana – Urban (PMAY-U), is Maharashtra's first fully community-led slum redevelopment initiative. It was implemented by Shelter Associates, a Pune-based NGO, in collaboration with the Kolhapur Municipal Corporation (KMC) and supported by the A.T.E. Chandra Foundation and DMI Foundation. The project involved active participation from residents, who formed a Cooperative Housing Society, contributed financially, and accessed housing loans to bridge funding gaps. This initiative highlights the convergence of government schemes, civil society, and community leadership. Additionally, Kolhapur hosts numerous NGOs focused on women's welfare, child education, and orphan care, with many volunteers contributing to social upliftment through education, vocational training, and healthcare services.

Sangli district has a rich tradition of voluntary social service organizations, which play a vital role in strengthening community life and complementing government efforts. According to the Gazetteers Department of Maharashtra, these organizations operate in diverse fields such as education, health, recreation, and rural development. They are formed by citizens to address local needs and often experiment with innovative solutions that the state machinery may not be able to implement directly. These institutions are flexible, progressive, and deeply rooted in local contexts.

[16] Gazetteers.maharashtra.gov.in and PIP document of Ichalkaranji 2012(cwas.org.in)

Despite financial constraints, they continue to support marginalized communities and work in tandem with government departments. NGOs in Sangli also focus on women's empowerment, child welfare, environmental conservation, and vocational training, contributing significantly to the district's social development landscape.

In Ichalkaranji, community organizations and civil society have been actively involved in improving urban services and promoting inclusive development. The Performance Improvement Plan (PIP) for Ichalkaranji, prepared by CEPT University and the All-India Institute of Local Self Government (AIILSG) in consultation with the Ichalkaranji Municipal Council (IMC), emphasizes the role of community engagement in areas such as water supply, sanitation, and slum services. The plan outlines strategies for achieving 24x7 water supply and making the city open defecation free, with community monitoring and feedback mechanisms playing a central role. Civil society groups have also contributed to health awareness, education, and waste management initiatives. The presence of local NGOs and citizen forums has helped bridge gaps in service delivery and foster accountability in municipal governance.

3.5 Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)[17]

Kolhapur has witnessed multiple incidents of sexual harassment and exploitation, particularly in vulnerable communities and institutional settings. Additionally, the region is part of Maharashtra's sugar belt, which sees seasonal migration of labourers from drought-prone areas. These migrant workers, including women and children, often face **financial and sexual exploitation** during the sugarcane harvest season. Reports highlight that women are coerced into exploitative contracts and face abuse from contractors and landowners. Despite legal frameworks like the POCSO Act and IPC provisions, enforcement remains inconsistent, and many cases go unreported due to fear and social stigma.

Sangli has seen disturbing cases of sexual harassment and abuse, including incidents involving minors and vulnerable youth. Civil society organizations like **SANGRAM**, based in Sangli, have been working to empower marginalized groups including sex workers and transgender individuals, advocating for rights and protection against SEA and SH. However, more systemic interventions are needed to address the rising tide of abuse.

In Ichalkaranji, a city known for its industrial vibrancy, issues of **Sexual Exploitation and Abuse (SEA)** and **Sexual Harassment (SH)** have surfaced as serious concerns, particularly in informal workspaces and vulnerable communities. In Ichalkaranji, the lack of formal complaint mechanisms and limited awareness among informal workers—especially women and youth—makes it difficult to report and address such misconduct effectively. The city's growing industrial base and dense urban settlements necessitate a proactive approach to SEA and SH, including community education, workplace policies, and accessible support systems. Strengthening these mechanisms is essential to ensure safety, dignity, and justice for all residents.

3.5.1 SEA/ SH Risks Identification

Risk identification of various sub-projects is carried out using the template (Annexure 6), designed on the basis of World Bank Good Practice Notes. Each sub-project is assessed with 8 pre-identified parameters namely:

[17]Annual Report of Sangram.org and a Newsletter by scroll.in (Dec2022)

a) Labor influx magnitude;
b) Worker–community interaction;
c) Presence of vulnerable groups (women, migrants, tribal);
d) Location characteristics;
e) Contractor ESHS capacity;
f) Community awareness & GRM;
g) Past SEA/SH incidents;
h) Camp accommodation.

Appropriate score is assigned to each parameter (0-No, 1-Low, 2-Moderate, 3- Substantial, 4-High). Thus, the maximum SEA/ SH risk score is 32. Risk categorization is done on following rating scale and appropriate safeguard instruments are proposed.

Table 33: SEA/ SH rating scale with safeguard instruments

Score	Risk	Safeguard instruments
0 – 8	**Low Risk**	Basic CoC, worker induction, GRM with SEA/SH-sensitive intake
8 – 16	**Moderate Risk**	CoC + training + mapping of services + referral pathways
16– 24	**Substantial Risk**	SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness
> 24	**High Risk**	Full SEA/SH Action Plan, specialist hire, survivor support MOUs, strong supervision, contractual penalties, strict restrictions on worker movement

3.5.2 Assessment of SEA/ SH risk rating for MRDP sub-projects

Based on the risk assessment done in Annexure 6.1, Annexure 6.2, Annexure 6.3, Annexure 6.4, Annexure 6.5, Annexure 6.6, it is revealed that, all the sub-projects in MRDP, except digital infrastructure sub-project have substantial SEA/ SH risk; whereas the digital infrastructure sub-projects have low SEA/ SH risk.

3.5.3 SEA / SH Action Plan

SEA/ SH Action Plan, consistent with the ESF, will be prepared, within 3 months from the commencement, of the project, for managing the risks of SEA/ SH and implemented throughout the project. This Action Plan will include sensitization and training of project staff on GBV/ SEA/ SH and site-specific Codes of Conduct (CoC). Dedicated SEA/ SH focal point will be assigned in PIUs. The implementation will be monitored through field visits, regular reporting and audits.

3.6 Implications for Project Design

a. The Project area is vulnerable to disasters, in particular to floods. Recurrently occurring floods causes wide range of damages including loss of life, livestock and property, disruption to economic activities and environmental damages such as soil erosion, water logging etc.
b. The Project needs to be considered not as a development project but as a disaster mitigation project.
c. Existing disaster management capabilities need to be strengthened on priority.
d. The high population density, rapid urbanization, and economic dependence on agriculture and industry necessitate robust, inclusive, and climate-resilient infrastructure.
e. Project interventions need to be tailored to address the socio-economic needs of the region and protect biodiversity.

4 ENVIRONMENT AND SOCIAL SCREENING PROCEDURES

This chapter summarizes the procedures to be followed, in respect of **each sub-project,** for identification of Environmental and Social (E&S) risks involved and designing appropriate safeguard measures. A process at glance, is given in Figure 3 below:

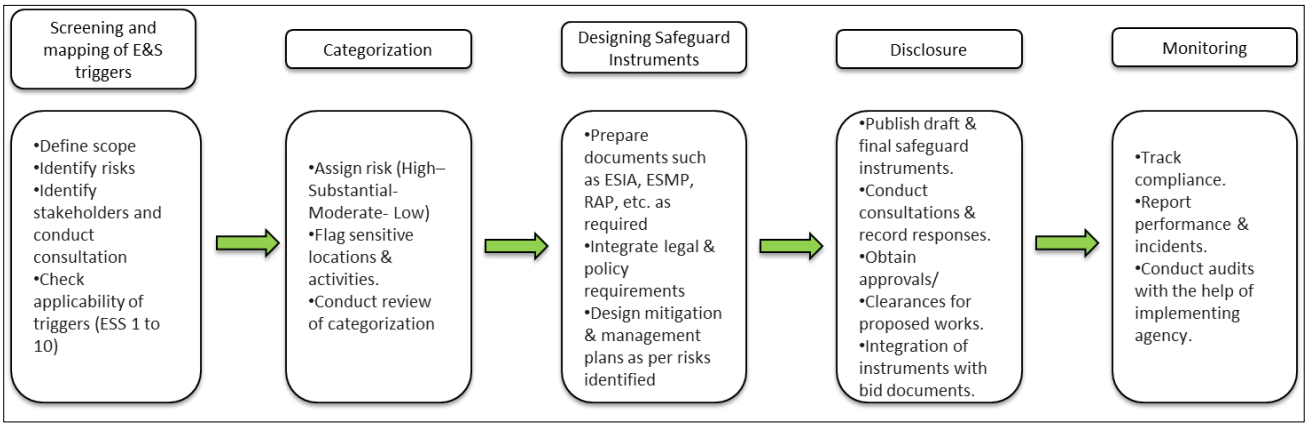

Figure 3: E&S risk identification and mitigation process

The process involves following five key steps:

a) Environmental and Social screening for identification of risks and impacts associated with the subproject and mapping of ESS triggers (ESS1 to ESS10);
b) Risk categorization of the subproject viz. **Low**, **Moderate**, **Substantial** and **High**;
c) Designing subproject specific appropriate safeguard instruments;
d) Discloser of documents;
e) Implementation of safeguard instruments and monitoring.

The detailed process for identification and mitigation of E&S impacts is outlined in Figure no. 4 below.

4.1 Screening process

E&S screening is to be done **prior to finalization of DPR** of each subproject with following objectives:

- Filter out activities that are ineligible or pose significant, irreversible risks;
- Establish baseline conditions;
- Identify key environmental and social features and determine the presence of any sensitive or hotspot areas;
- Identify E&S risks and impacts associated with subproject, at early stage;
- To map applicable E&S standards (ESS1 to ESS 10);

Data captured in screening helps for assigning the appropriate risk category to the subproject viz. Low, Moderate, Substantial, High and designing the appropriate safeguard instruments.

Screening is primarily focused on three parameters viz environmental screening, social screening and institutional capacity assessment to manage E&S risks.

In the screening process baseline data collection is done, identifying the project influence area which includes all zones likely to be directly, indirectly, or cumulatively affected by the subproject's construction, operation, and associated facilities. This also covers areas impacted by unplanned but predictable developments caused by the subproject and cumulative impacts from other activities within the area of influence. Baseline environmental and social data encompassing physical, chemical,

biological, and socioeconomic aspects are gathered through secondary literature reviews and primary data collection. Primary surveys focus on assessing wildlife habitats, ecological conditions, ambient air and noise quality, surface water, groundwater quality, and the socioeconomic status of local communities.

Under the MRDP, environmental and social (ES) screening of subprojects will be done following a structured process, designed to ensure alignment with World Bank Environmental and Social Standards, National and State Regulations.

The procedure begins with an initial review of each proposed subproject against an exclusion list to filter out activities that are ineligible or pose significant, irreversible risks. For subprojects that pass this filtering stage, a standardized E&S screening forms provided in Annexure 1 and Annexure 2 are to be completed, to assess potential environmental and social risks and impacts, considering the nature, scale, and location of the activities. This screening identifies key risks—such as land acquisition, displacement, impacts on vulnerable groups, labour influx, community health and safety—and other subproject specific impacts such as disruption of traffic, disruption of utilities, deterioration of water quality of the stream or river etc.

The screening checklist is informed by site visits, stakeholder consultations, and discussions with the subproject design and construction teams.

The detailed procedure for risk identification, categorization and mitigation is outlined in the flowchart below:

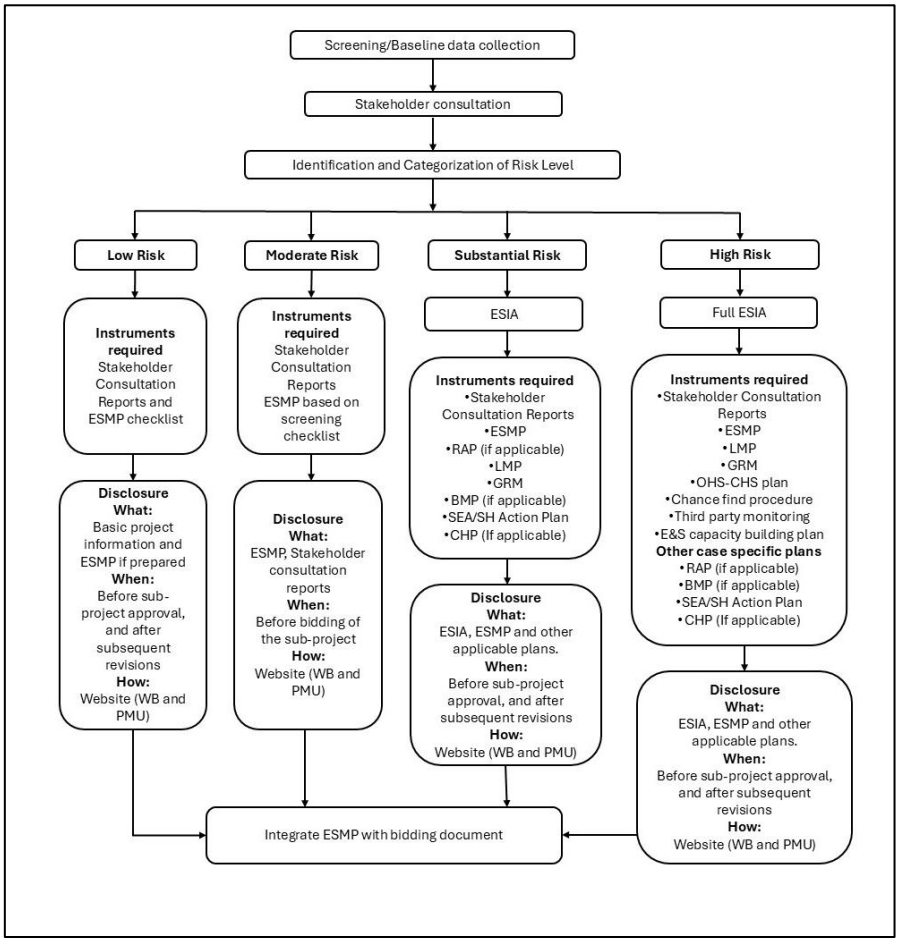

Figure 4: Detailed procedure for risk identification, categorization and mitigation

4.2 Environmental and Social Risk Categorization

4.2.1 Ineligible Subprojects

The World Bank applies a strict exclusion list to subprojects and activities it will not finance, based on its Environmental and Social Framework and international best practices (including the IFC Exclusion List). The following are examples of subprojects and activities excluded from World Bank financing:

- Production or activities deemed illegal under national laws, regulations, or international conventions and agreements, or subject to international bans (e.g., certain pharmaceuticals, pesticides, ozone-depleting substances, PCBs, wildlife or products regulated under CITES);
- Production or trade in weapons and munitions, including paramilitary materials;
- Production or trade in alcoholic beverages (excluding beer and wine) and tobacco;
- Gambling, casinos, and equivalent enterprises;
- Production or trade in radioactive materials, except for medical or quality control equipment with adequately shielded sources;
- Production or trade in unbonded asbestos fibers;
- Drift net fishing in the marine environment using nets in excess of 2.5 km in length;
- Critical habitats such as Dajipur Wildlife Sanctuary in Kolhapur and Mayani Bird Sanctuary in Sangli remain undisturbed. Consolidated Maharashtra map showing National parks, WLS, ramsar, wetlands and the project area is provided as Figure 5 and Figure 6;
- Commercial logging operations for use in primary tropical moist forests, or trade in wood/forestry products not from sustainably managed forests[5];
- Production or activities involving harmful or exploitative forms of forced labour or harmful child labour;
- Trade in wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species (CITES);
- Transboundary movements of hazardous waste prohibited under international law (e.g., Basel Convention);
- Production or trade in hazardous chemicals subject to international phase-outs or bans, including persistent organic pollutants, mercury, and ozone-depleting substances;
- Activities prohibited by host country legislation or international legal instruments relating to biodiversity, cultural heritage, or human rights;
- Projects resulting in the conversion or degradation of critical habitats or natural forests, or unsustainable fishing practices;
- Any activity that impinges on the lands owned or claimed by Indigenous Peoples without their full documented consent;
- Projects involving prisons, detention centers, or activities limiting individual rights and freedoms;
- Any firm or individual debarred or ineligible for World Bank financing due to fraud, corruption, or other sanctionable practices;

4.2.2 Risk categorization

As per the World Bank Environmental and Social Framework, the sub-projects will be classified under following four E&S risk categories, based on the type and extent of potential environmental and social risks. The risk categorization templates along with scoring criteria are provided in Annexure 3, Annexure 4 and Annexure 5.

High Risk (H) proposed project interventions that have the potential for severe adverse environmental and social impacts that are diverse, irreversible or unprecedented. Project activities that are likely to have high environmental and social impacts will require full Environmental and Social Impact Assessment (ESIA). The ESIA will identify the impacts and mitigation measures, based on which an activity specific to the Environmental and Social Management Plan (ESMP) will be prepared. The ESMP will list the impacts, mitigation measures, responsible parties, timeframe for implementation, monitoring systems, and budget. The ESMP will be integrated with the bid documents, and the contractor is bound to implement it. The sub-projects having high E&S risks, require safeguards measures such as ESMP, Stakeholder Consultation Report, LMP, GRM, OHS-CHS plan, Chance Find Procedures, Third party monitoring, Capacity Building Plan and other case specific applicable plans such as RAP, BMP, SEA/ SH Action Plan, CHP.

Substantial-risk (S) proposed project interventions may have the potential for adverse environmental and social impacts but are less adverse than those of high -risk proposed project interventions. The sub-projects having substantial E&S risks require safeguards measures such as ESMP, Stakeholder Consultation Report, LMP, GRM, and other case specific applicable plans such as RAP, BMP, SEA/ SH Action Plan, CHP.

Moderate Risk (M): Project activities that are likely to have moderate environmental and social impacts need not prepare an ESIA. These impacts are likely to be temporary and reversible and are not expected to have lasting effects on the proposed project intervention areas. Based on the Screening Checklist and generic ESMP provided in Annexure 16, sub-project specific ESMP will be prepared. The ESMP will be integrated into the bid documents, and the contractor is bound to implement it.

Low-risk (L) proposed sub-project interventions will have negligible or no negative impacts, and no further environmental assessment will be needed, following the initial screening process. ESMP checklist will be prepared, followed by monitoring and supervision.

4.3 Designing subproject specific safeguard instruments

Based on the risk category and ESS triggers and inputs received in stakeholder consultation, type and depth of safeguard instruments, are determined. Safeguard instruments include simplified checklist/ ESIA/ full ESIA, ESMP, RAP, LMP, GRM, OHS-CHS plan, Chance find procedures, BMP, SEA/SH Action Plan etc. As a thumb rule, LMP will be mandatory for all civil works. SEP and GRM will be mandatory for all risk categories. The safeguard instruments will be designed considering the World Bank ESF and Good Practice Notes. Risk category specific, standard safeguard instruments are as follows:

Risk Category	Standard Safeguard Instruments
Low -	Simplified/Generic ESMP or ESMP Checklist
Moderate -	ESMP, SEP, LMP

Substantial - ESIA, ESMP, RAP/ARAP (if applicable), SEA/SH Action Plan guided by World Bank Good Practice Notes, case specific multiple plans such as LMP, OHS-CHS plan, BMP, CHP, Chance Find Procedures, Capacity Building Plan.

High - Full ESIA, Comprehensive ESMP, Case specific multiple plans such as LMP, OHS-CHS plan, Chance Find Procedures, Capacity Building Plan and other case specific applicable plans such as RAP, BMP, SEA/SH Action Plan guided by World Bank Good Practice Notes, CHP and Third-Party Evaluation Plan.

4.4 Discloser

Stakeholder consultation reports, ESIA, ESMP and other applicable plans will be disclosed before project approval and after subsequent revisions, for the knowledge of stakeholders and to have transparency. The documents will be disclosed on the website of the World Bank and that of PMU. Executive summaries of the important documents will be translated into local languages and make them accessible in local offices and online. Safeguard instruments will be integrated with the bid documents. Hard copies will be made available at offices of the PIU and PMU.

4.5 Monitoring

A comprehensive monitoring system will be established to:

- Track implementation of all safeguard requirements;
- Assess the effectiveness of mitigation measures and identify areas requiring enhancement;
- Ensure compliance with World Bank ESSs, national legislation, and project specific commitments.

Monitoring indicators will be aligned with the Environmental and Social Commitment Plan (ESCP). Monthly and quarterly monitoring reports will be prepared by the respective PIU's and contractors, as applicable. Periodic internal and third-party audits will be undertaken to assess compliance with ESF requirements, including:

- Environmental performance
- Labor and working conditions (ESS2)
- Community health and safety measures (ESS4)
- Land acquisition and resettlement processes (ESS5)
- Biodiversity and cultural heritage management (ESS6, ESS8)

Based on monitoring findings, corrective actions and adaptive management strategies will be developed and implemented, consistent with the ESF's emphasis on dynamic, risk responsive project management.

4.6 Stakeholder Consultations

Stakeholder consultations will be carried out during all phases of the subproject. The consultation process begins with stakeholder identification and ends with discloser of the stakeholder consultation reports.

The stakeholders of the Project have been classified into the following two categories:

- Project-affected parties include people, groups, and institutions that either directly influence the project or are directly impacted (positively or adversely) by the project and its activities. These stakeholders include local communities, civil society organizations, etc.
- Other-interested parties are those that have a bearing on the project and its activities by virtue of their being closely linked or associated with the primary stakeholders, and due to the influence, they have on the primary stakeholder groups.
- Vulnerable and Disadvantaged Households.

Stakeholder consultations will be carried out during screening and project formulation to obtain their feedback and address their concerns. There after the process of consultations will be continued throughout the project lifecycle including preparation of draft ESIA/ESMP. **The brief summary of stakeholder consultations done so far along with inputs received and action taken on these inputs is provided in Section 3 and Annexure 14.**

5 SUB-PROJECT SPECIFIC POTENTIAL BENEFITS AND E&S IMPACTS

5.1 Risk categorization approach

This chapter presents overview of the sub-project specific Environmental and Social risks and SEA/ SH risks. The risk categorization exercise is done, using sub-project specific screening, based on pre-identified relevant parameters and assigning appropriate scores based on its extent of impact. The sub-projects covered under MRDP are broadly classified in following six groups, based on their nature of work and activities involved for risk categorization exercise. :

a) Radhanagari dam civil works;
b) River training civil works;
c) Water storage structures in the free catchment;
d) Landslide mitigation works;
e) Urban storm water works;
f) Digital interventions / capacity building / feasibility studies.

5.2 Overview of risk categorization

- Sub-projects involving civil works related to Radhanagari dam has substantial E&S risk and Substantial SEA/ SH risks.
- Civil works related to river training works, new water storage works, landslide mitigation works, urban storm water works has Substantial E&S and SEA / SH risks.
- Civil works related to maintenance of existing water storage structures in free catchment has moderate E&S and SEA/ SH risks.
- Digital intervention based sub-projects / capacity building sub-projects / feasibility studies has low E&S and SEA/ SH risks.

5.3 Component wise Sub-Project Specific Summary and Table

Component-wise, Sub-project specific details of potential benefits, potential E&S impacts, identified risk category, identified SEA/SH risk category, relevant ESS triggers and required safeguard instruments are presented in table 34 to 38 below. This table also gives information such as requirement of land acquisition and labour deployment (column 4: Potential E&S impacts).

5.3.1 Component 1

Component 1 interventions will mainly consist of Climate-informed Flood Risk Management to reduce fluvial flood risk in the upper Krishna sub-basin through a mix of mitigation solutions. The intervention will involve civil works primarily related to rejuvenation of existing natural drainage system, river training work which includes restoration, enhancement, removal of silt, redundant structures, rock outcrops and islands, of selective reaches of Krishna River, and retrofitting of existing sluice gates and provision of additional spillway to Radhanagari dam.

Table 34: Sub-project specific benefits, E&S Impacts, E&S and SEA/ SH risks and Safeguard instruments – Component 1

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
1	Upgradation of the existing Real Time Data Acquisition System (RTDAS)	After upgradation of the system, seamless flow of real time data of the rainfall, stream flow and reservoir storages will be captured in the system. This will help in A) Efficient reservoir operations which will ensure more conservation storage at moderate flood risks; B) Moderating the flood peaks;	**Low Risk**: • Generation of e-waste; • Increased energy consumption (increased carbon footprint); • Increased rare earth minerals used (resource use); • Cyber security.	**Low**	Annexure 5 and Annexure 6.6	ESS 1, ESS3, ESS10	E&S Screening checklist and ESMP

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
		C) Early and precise warning of the incoming floods to downstream population; D) The loss of livestock, people and property can be saved.					
2	Upgradation of Data Centre at Pune	Faster processing of the climate data thereby more accurate and quick information about the incoming flood. This will help in Moderating the flood peaks A) Early and precise warning of the incoming floods to downstream population;	**Low Risk**: • Generation of e-waste; • Increased energy consumption (increased carbon footprint); • Increased rare earth minerals used (resource use); • Cyber security.	**Low**	Annexure 5 and Annexure 6.6	ESS 1, ESS3, ESS10	E&S Screening checklist, ESMP and E-waste management plan.

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
		B) More time for preparation to meet flood event; C) This will reduce loss of livestock, people and property.					
3	Strengthening existing Real Time Stream Flow and Decision Support System (RTSF and DSS), i.e. operation flood forecasting system and developing Climate Informed Integrated Reservoir Operation and Management System, including capacity building, software and manpower for 5 years.	Accuracy of decision support system for the reservoir operation will be increased. Inundation maps will be available in advance. The precise information can be shared with community well in advance. This will help in flood management & give more protection to the community from flood induced losses;	**Low Risk**: • Generation of e-waste; • Increased energy consumption (increased carbon footprint); • Increased rare earth minerals used (resource use); • Cyber security.	**Low**	Annexure 5 and Annexure 6.6	ESS 1, ESS3, ESS10	E&S Screening checklist and ESMP

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
4	Website Development for Flood Alerts, Flood Related Data and Information Dissemination Data and Information Dissemination	This will enable quick dissemination of flood related alerts to the administration as well as to community. Protection level against flood induced losses will be increased.	**Low Risk**: • Cyber security.	**Low**	Annexure 5 and Annexure 6.6	ESS 1, ESS3, ESS10	E&S Screening checklist and ESMP
5	Retrofitting of existing sluice gates and provision of additional spillway to Radhanagari dam.	This will allow early depletion of dam in anticipation of approaching flood. This will help in moderation and flood peaks and hence the losses due to flood. Will give more protection against flood particularly to Kolhapur city.	**Substantial Risk:** • No land acquisition, no displacement, no diversion of forest land, the work is proposed in land, in possession of WRD; • Proximity to WLS but separated from work area by water body; WLS corridors not affected; • The work near the existing dam, hence, requires precautions	**Substantial**	Annexure 3.1 and Annexure 6.1	ESS1, ESS2, ESS3, ESS4, ESS6, ESS8, ESS10	ESIA, ESMP, SEP, LMP, SEA/SH Action Plan, Muck disposal plan, Cultural Heritage Management Plan, Instrumentation Plan,

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
			such as vibration monitoring, from dam safety point of view; • Tree cutting (about 80). Loss of biodiversity • Disposal of excavated stuff; • Air pollution at construction site due to dust; • OHS Risks; • Labour influx; Approximately 50 migrant workers are expected; • GBV; • Noise pollution;				
6	Replacing the hydraulically inefficient Sangli KT Weir with barrage;	This will remove obstruction to river flow during flood, moderate the flood peaks and hence will offer larger	**Substantial Risk** • Soil and water contamination due to spillage of lubricants and other substances	**Substantial**	Annexure 3.2 and Annexure 6.2	ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS8, ESS10	ESIA, ESMP, SEP, LMP, SEA/SH Action Plan, Muck disposal

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
		protection against the flood hazards particularly to Sangli city.	from the construction facilities • Disposal of excavated stuff; • Air pollution at construction site due to dust and heavy vehicle traffic; • OHS Risks; • Labour influx; Approximately 50 migrant workers for 2 years; • GBV; • Water pollution;				plan, Cultural Heritage Management Plan, Sediment management plan.
7	Rejuvenation of Existing Natural Drainage System draining into Krishna River	This will act as retention storages, moderate the flood peaks . Also, this will facilitate early recession of flood and more efficient draining of pluvial flood. Will offer	• Substantial Risk: • Disposal of excavated stuff; • Livelihood impact on encroachers - • Air pollution at construction site due	**Substantial**	Annexure 3.2 and Annexure 6.2	ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS8, ESS10	ESIA, ESMP, SEP, LMP, SEA/SH Action Plan, Muck disposal plan, Sediment management plan.

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
		flood protection to land, property , livestock and people residing along these nallas.	to dust and heavy vehicle traffic; • OHS Risks; • Labour influx; Approximately 100 migrant workers spread over multiple location for 1 year; • GBV; • Water pollution;				
8	Rejuvenation of Existing Natural Drainage System draining into Panchganga River	This will act as retention storages, moderate the flood peaks . Also, this will facilitate early recession of flood and more efficient draining of pluvial flood. Will offer flood protection to land, property , livestock and people residing along these	**Substantial Risk:** • Disposal of excavated stuff; • Livelihood impact on encroachers - • Air pollution at construction site due to dust and heavy vehicle traffic; • OHS Risks; • Labour influx; Approximately 100 migrant workers	Substantial	Annexure 3.2 and Annexure 6.2	ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS8, ESS10	ESIA, ESMP, SEP, LMP, SEA/SH Action Plan, Muck disposal plan, Sediment management plan.

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
			spread over multiple location for 1 year; • GBV; • Water pollution;				
9	River Training Works (To be finalized after river flow modelling)	Moderation of flood peaks and increasing discharge carrying capacity of the river, giving protection against flood	**Substantial Risk** • Acquisition of land for selective enlargement of cross sections, paleo channels, levees/flood banks and straightening of meanders; DPR based on model studies will decide the extent of land acquisition. Approximately, 140 hectares of private land and 75 hectares of government land across Krishna and Panchganga river will be acquired.	**Substantial**	Annexure 3.2 and Annexure 6.2	ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS8, ESS10	ESIA, ESMP, SEP, LMP, SEA/SH Action Plan, Muck disposal plan, Cultural Heritage Management Plan, Sediment management plan.

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
			• As per drone and walkthrough survey, no houses are affected; no shifting of people is anticipated. • Loss of livelihood; Acquisition of private land may affect means of livelihood of landlords and those dependent on farming. Also, some farmers may lose access to productive assets. • Excess sediment movement downstream can cause turbidity, affecting water quality and aquatic life. • Disposal of excavated stuff and land use alteration				

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
			• Disruption of river morphology; • Removal of rock outcrops and islands may disturb existing fish breeding grounds and other aquatic organisms. • Alteration the river's natural course may impact downstream ecosystems, habitat and aquatic biodiversity. • Risk of altered land use because of temporary debris/ silt disposal arrangements. • Excess sediment movement downstream can cause turbidity, affecting				

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
			water quality and aquatic life. • Increased risk of noise and dust pollution. • During construction labour influx related issues; Large scale civil works will require migrant works, approximately 300 migrant workers are expected but they will be working in groups of 25 at one location, requiring labour camps; Likely to strain local resources; and trigger risk related to SEA/ SH. • Lack of adequate stakeholder consultation can result in spread of				

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
			misinformation and unrest. • Issues of road safety due to movement of construction vehicles;				
10	Implementation and maintenance of existing and construction of new flood mitigation water storage structures in Krishna and Panchganga river free catchment in Kolhapur and Sangli districts.	The rejuvenated existing water storage structures, new water storage structures and water conservation works will moderate flood peaks and hence, reduce the flood related risks.	**Substantial Risk** • Acquisition of land for new water storage structures. DPR based on detailed survey, will decide the extent of land acquisition. As a rough estimate, approximately, total 50 Ha of land (for multiple new storage structures). • Displacement in case of new water storage structures and Loss of livelihood; • Impact on flora and fauna;	**Substantial** for new water storage structures and **Moderate** for desilting / maintenance of existing water storage structures.	Annexure 3.3 and Annexure 6.3	ESS1, ESS2, ESS3, ESS5, ESS6, ESS8, ESS10	ESIA, ESMP, RAP, SEA/SH Action Plan, Construction Waste Disposal Plan.

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Reference to E&S and SEA/SH risk Mapping	Relevant ESS Triggers	Safeguard Instruments Required
			• Significant scale of construction waste; • OHS risks; • Risks due to labour influx; Approximately 150 migrant workers spread over multiple locations in a group of 25 for 2 years; • SEA/ SH risk; • Alteration the river's natural course may impact downstream ecosystems, habitat and aquatic biodiversity;				

5.3.2 Component 2

This component includes two sub-components:

A) **Reducing urban flood risks**-Under this sub-component, Storm water drainage systems shall be designed and implemented within the jurisdiction of Kolhapur, Sangli and Ichalkaranji corporations. This will give protection to the community against urban flooding and also

improve the community health and hygiene. At present in the absence of Storm Water Drainage systems (SWDs), these areas are experiencing stagnant water accumulation which has led to mosquito transmitted diseases.

B) **Multi hazard resilience in Districts and Cities**- This sub-component includes landslide risk assessment and mitigation measures.

The E&S benefits and risks related to the sub-components are given in below:

Table 35: Potential E & S Benefits and Risks – Component 2

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Annexure reference E&S risk and SEA/SH risk	Relevant ESS	ESS instrument required
11	Construction and implementation of Storm Water Works for Urban Flood Mitigation in Kolhapur Municipal Corporation (KMC).	Properly constructed stormwater drains help prevent urban flooding by efficiently channelizing excess runoff to designated outfalls. By directing stormwater flow, these drains prevent stagnant water accumulation, reducing erosion and land degradation and mosquito breeding. It is worth to mention here that in the absence of proper drainage system most of the areas in Kolhapur city are very often suffering from mosquito spread diseases.	**Substantial risk.** • No acquisition of land or displacement; • Few appurtenant components of structures such as fencing, compound wall will be temporarily impacted; • There would be temporary loss of livelihood of some street vendors;	Substantial	Annexure 4 and Annexure 6.5	ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS10	ESIA, ESMP, Construction Waste Management Plan, SEA/ SH Action Plan
12	Construction and implementation of Storm Water Works	Properly constructed stormwater drains help prevent urban flooding by efficiently channelizing excess		Substantial	Annexure 4 and	ESS1, ESS2,	ESIA, ESMP, RAP,

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Annexure reference E&S risk and SEA/SH risk	Relevant ESS	ESS instrument required
	for Urban Flood Mitigation in Sangli-Miraj-Kupwad Municipal Corporation (SMKMC).	runoff to designated outfalls. By directing stormwater flow, these drains prevent stagnant water accumulation, reducing erosion and land degradation and mosquito breeding. It is worth to mention here that in the absence of proper drainage system most of the areas in Sangli city are very often suffering from mosquito spread diseases.	• Large scale of civil work; • Large scale removal of silt and sludge; • Disruption of utility services during construction; • Noise and dust pollution during construction; • Risk due to labour influx; Approximately 150 migrant workers spread over multiple locations group of 25 at one site for 3 years; • Disruption of urban traffic during construction; • OHS risks; • SEA/ SH risks.		Annexure 6.5	ESS3, ESS4, ESS5, ESS6, ESS10	Construction Waste Management Plan, SEA/ SH Action Plan
13	Construction and implementation of Storm Water Works for Urban Flood Mitigation in Ichalkaranji Municipal Corporation (IMC).	Properly constructed stormwater drains help prevent urban flooding by efficiently channelizing excess runoff to designated outfalls. By directing stormwater flow, these drains prevent stagnant water accumulation, reducing erosion and land degradation and mosquito breeding. It is worth to mention here that in the absence of proper drainage system most of the areas in Ichalkaranji city are		Substantial	Annexure 4 and Annexure 6.5	ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS10	ESIA, ESMP, RAP, Construction Waste Management Plan, SEA/ SH Action Plan

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Annexure reference E&S risk and SEA/SH risk	Relevant ESS	ESS instrument required
		very often suffering from mosquito spread diseases.					
14	Preparation of Landslide Hazard Assessment & Detailed Project Report for Landslide Mitigation Measures across eight identified sites in Kolhapur District, Maharashtra and implementation of the landslide mitigation measures.	Restoration efforts, such as reforestation or soil stabilization techniques, can significantly reduce soil erosion and improve soil structure, leading to long-term stabilization of the land. This will reduce the risk of landslide hazards.	**Moderate risk** • Impact on flora and fauna; • High OHS risk; • Use and storage of explosives; • Generation of construction waste; • Substantial SEA/ SH risks.	Substantial	Annexure 3.4 and Annexure 6.4	ESS1, ESS2, ESS3, ESS6, ESS10	ESIA-ESMP, Training plan for OHS, traffic management plan (if works are in ghat roads), SEA/ SH Action Plan.

5.3.3 Component 3

This component includes upgrading Emergency Management Capacities by Strengthening multi-level emergency preparedness and response capabilities. The project primarily aims to upgrade state, district, and city emergency operation centers with state-of-the-art command and control facilities for improved situational awareness and decision-making, strengthen early warning systems, Climate-informed multi-hazard risk assessments for districts using innovative approaches.

Table 36: Potential E & S Benefits and Risks – Component 3

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Annexure reference E&S risk and SEA/SH risk	Relevant ESS	ESS instrument required
15	Services of Integrated Emergency Operation Centre (EOC) Management Suites (IEMS) for EOCs	It will provide central command and control hub for managing disasters and emergencies. It will have a critical role in disaster preparedness, response and recovery efforts. It will also help in monitoring the rescue operations.	**Low Risk**: • Generation of e-waste; • Increased energy consumption (increased carbon footprint); • Increased rare earth minerals used (resource use); • Cyber security.	**Low**	Annexure 5 and Annexure 6.6	ESS 1, ESS3, ESS10	E&S Screening checklist and ESMP
16	Development of the Climate inclusive multi-hazard vulnerability assessment for Maharashtra (HRVA, DRDB, Dynamic and Digital Disaster Risk	This will provide digital platform for resilience-building and resilient development planning.	**Low Risk**: • Generation of e-waste; • Increased energy consumption (increased carbon footprint);	**Low**	Annexure 5 and Annexure 6.6	ESS 1, ESS3, ESS10	E&S Screening checklist and ESMP

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Annexure reference E&S risk and SEA/SH risk	Relevant ESS	ESS instrument required
	Assessment) and integration with IEMS		• Increased rare earth minerals used (resource use); • Cyber security.				
17	Flood EW Dissemination System for the Krishna Basin (mechanism tbd, after onboarding IEMS consultant, WRD/MKVDC) and integration with IEMS.	This will provide critical, timely data on impending flooding, enabling the authorities for flood preparedness and to evacuate the residents, protect the properties and reduce fatalities. This will save lives, reduce injuries and minimize the economic losses.	**Low Risk**: • Generation of e-waste; • Increased energy consumption (increased carbon footprint); • Increased rare earth minerals used (resource use); • Cyber security.	**Low**	Annexure 5 and Annexure 6.6	ESS 1, ESS3, ESS10	E&S Screening checklist and ESMP
18	Development and installation of Landslide EWS (Local Systems Lo-LEWS) and integration with IEMS (mechanism tbd,	The implementation of an Integrated Emergency Operation Centre (EOC) for landslide mitigation can enhance early	**Low Risk**: • Generation of e-waste; • Increased energy	**Low**	Annexure 5 and Annexure 6.6	ESS 1, ESS3, ESS10	E&S Screening checklist and ESMP

Sr.no	Sub-project	Potential Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Annexure reference E&S risk and SEA/SH risk	Relevant ESS	ESS instrument required
	after completion of landslide hazard and risk assessment study under the consultancy services for mitigation work in 8 sites of Kolhapur)	warning systems, helping communities' invulnerable areas prepare and respond to potential landslides, thereby reducing loss of life and property.	consumption (increased carbon footprint); • Increased rare earth minerals used (resource use); • Cyber security.				

5.3.4 Component 4

This component involves Private Capital Mobilization for Risk Financing by enhancing the financing capabilities and fiscal resilience of GoM across administrative scales. This component will not involve any civil work and will not have any direct or indirect adverse environmental and social impacts.

Table 37: Potential E & S Benefits and Risks – Component 4

Sr.no	Sub-project	Potential Environmental and Social Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Annexure reference E&S risk and SEA/SH risk	Relevant ESS	ESS instrument required
19	Development of Digital Platform for disbursement of	This will reduce the time required for disbursement of funds directly to beneficiaries by	**Low risk** • Cyber security;	**Low**	Annexure 5 and Annexure 6.6	ESS 1, ESS3, ESS10	E&S Screening checklist and ESMP

Sr.no	Sub-project	Potential Environmental and Social Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Annexure reference E&S risk and SEA/SH risk	Relevant ESS	ESS instrument required
	premium subsidy to beneficiaries	eliminating manual processing and intermediaries. This will also ensure that the intended amount reaches to genuine recipient in full.	• Exclusion of remote population; • E-waste; • Carbon footprint (data centres and cloud hosting).				

5.3.5 Component 5

This is a soft component and will not have any adverse environmental and social impacts.

Table 38: Potential E & S Benefits and Risks – Component 5

Sr.no	Sub-project	Potential Environmental and Social Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Annexure reference E&S risk and SEA/SH risk	Relevant ESS	ESS instrument required
20	Strategic Study and Capacity Building for Knowledge Framework and Resilience Development in cities,	This includes knowledge management activities for capacity building of the implementing agencies for co-	**Low risk** • Gender discrimination in selection of participants;	**Low**	Annexure 5 and Annexure 6.6	ESS 1, ESS3, ESS10	E&S Screening checklist and ESMP

Sr.no	Sub-project	Potential Environmental and Social Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Annexure reference E&S risk and SEA/SH risk	Relevant ESS	ESS instrument required
	including detailed GIS study for city resilience	ordination, financial management, procurement, environmental and social risk management, communication, monitoring and evaluation, stakeholder engagement. Development of knowledge lighthouse for dissemination of knowledge at state and county level. This will introduce clear institutional framework for data sharing and co-ordination between disaster ensuring seamless collaboration across agencies working for disaster mitigation. and	• Language barrier; • Participation of remote participants; • SEA/ SH risks during residential trainings; • Unsafe accommodation during trainings / visits; • Waste generation during workshops (plastic bottles, training materials, catering waste).				
21	Resilience and Feasibility Analysis for River Flooding Resilience and Disaster Resilience and Development of Knowledge Lighthouse for resilience in Maharashtra, including institutionalization of NDMA guidelines						

Sr.no	Sub-project	Potential Environmental and Social Benefits	Potential E&S Impacts and Identified risk category	Identified SEA/ SH Risk category	Annexure reference E&S risk and SEA/SH risk	Relevant ESS	ESS instrument required
		improve disaster risk management across the State. This will add value not only to project implementation but also to E&S safeguards implementation.					

6 PROJECT LEVEL E&S RISK MITIGATION INSTRUMENTS

The environmental risks and impacts identified in Chapter 5 will be addressed through the following mitigation and management frameworks and plans as per applicable ESSs of The World Bank. These framework documents and procedures have been prepared and disclosed. During the project implementation, these documents will be revised and disclosed when needed, with prior approval of the World Bank.

6.1 Resettlement Planning Framework

The Maharashtra Resilient Development Project (MRDP) is designed to strengthen climate resilience and disaster risk management throughout Maharashtra by focusing on flood risk mitigation, multi-hazard resilience, emergency management, risk financing, and implementation support. The project is structured around five key components: climate-informed flood risk management, multi-hazard resilience in cities and districts, emergency management enhancement, private capital mobilization for risk financing, and implementation support with knowledge management. To address social impacts, arising out of land acquisition and physical / economic displacement, the Resettlement Policy Framework (RPF) has been prepared, which ensures that any land acquisition or resettlement is minimized and done in fair and transparent way, in line with National laws such as the RFCTLARR Act, Maharashtra's Direct Land Purchase Policy, and the World Bank's ESS5. The RPF provides principles and procedures for managing social impacts, bridging gaps between National, State, and World Bank requirements, and guiding the preparation of Resettlement Action Plans (RAPs).

However, Sangli and Kolhapur districts (project impact area) are not included in the Schedule V, designated under Article 244 (1), of the Constitution of India. As such, Panchayat Extension of Scheduled Area (PESA), 1996, enacted to respect and preserve the traditional tribe governance and customs is also not applicable to the project area.

ESS 7 of the World Bank is typically triggered when the indigenous people have "collective attachments" to the land. In Indian context, ESS 7 is applicable to those areas which are included in Schedule V of the Constitution of India. **Thus, full Indigenous People Policy Framework (IPPF) is not required for MRDP.**

RPF also provides Entitlement Matrix, for the Project Affected Person's (PAPs).

However, any Schedule tribe families living at scattered locations in the project implementation area will be recognised as vulnerable households and special assistance will be made entitled to these households. Entitlement matrix, included in sub-project specific RAP will include provisions for this special assistance.

MRDP, except in River Training Works and Construction of New Water Storage Structures in the Free Catchment, does not anticipate any noticeable land acquisition and displacement. In stormwater drainage system works, proposed in three municipal corporations, there is no land acquisition involved; however, some minor temporary impacts are anticipated on private and commercial structures. Compensation will be based on replacement cost principle and covers land, structures, trees, and livelihoods, along with provisions, for skill development and relocation support. A Grievance Redressal Mechanism (GRM) is in place to address concerns, while project oversight is managed by the Project Management Unit (PMU) at MITRA and Project Implementation Units (PIUs) at municipal and state levels. Regular monitoring ensures compliance with social safeguards,

stakeholder participation, and effective grievance redressal, thereby supporting Maharashtra's climate resilience while prioritizing community welfare. In line with the RPF, RAPs will detail the nature and extent of social and livelihood impacts, categorize affected persons, and outline entitlement measures and budgets.

6.2 Labour Management Procedures

The Labour Management Procedures (LMP) for the Maharashtra Resilience Development Project (MRDP) provide a comprehensive framework to manage labour-related risks and ensure worker welfare in alignment with India's national labour laws and the World Bank's Environmental and Social Standard 2 (ESS2). The LMP covers all categories of project workers—including direct and contracted workers—engaged through the Project Management Unit (PMU), Project Implementation Units (PIUs), contractors, and consultants. LMP addresses key labour risks such as hazardous work environments, occupational safety, child and forced labour, labour influx, and gender-based violence (GBV). It establishes clear requirements for occupational health and safety (OHS), mandates the use of Personal Protective Equipment (PPE), and outlines protocols for worker training, grievance redress, and compliance monitoring.

The primary estimate of sub-project specific labour requirements, duration of deployment and category of workers is provided in Annexure 11.

Implementation of the LMP is overseen by MITRA and its PIUs, with regular audits, site inspections, and reporting to ensure adherence. Contractors are required to submit their own Labour Management Plans and Environmental and Social Management Plans (ESMPs) prior to commencing work. The LMP also mandates a robust Grievance Redress Mechanism (GRM) that is accessible, confidential, and responsive to all workers, including mechanisms for addressing GBV-related complaints. LMP is in Compliance with key Indian labour laws such as Code of wages, 2019, Industrial relations code 2020, Code on social security 2020, Occupational Safety, Health & Working Conditions (OSH) Code, 2020, Child Labour (Prohibition & Regulation) Act 1986, Inter-State Migrant Workmen's (Regulation of Employment & Conditions of Service) Act 1979 Employees Compensation Act, 1923, Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013, Bonded Labour System (Abolition) Act, 1976. All sub-project contracts will reflect these standards. The LMP's approach ensures ethical employment practices, fair wages, safe working conditions, and effective management of labour influx and community relations, thereby supporting the overall sustainability and success of the MRDP.

Key Actions Needed:

- Conduct induction and regular OHS training for all workers and supervisors.
- Ensure strict prohibition of child and forced labour, with verification of worker age and regular audits.
- Implement and monitor use of PPE and adherence to safety protocols at all sites.
- Establish and operate a confidential, accessible Grievance Redress Mechanism for all workers, including for GBV and SEA/SH complaints.
- Prioritize local hiring where possible to minimize labour influx and related risks.
- Maintain detailed records of all direct and contracted workers, including migrant labour.
- Require contractors to prepare and update site-specific Labour Management Plans and ESMPs.

- Ensure compliance with national labour laws and World Bank ESS2 through regular site inspections, audits, and reporting.
- Include Codes of Conduct for workers and contractors, with clear sanctions for violations.
- Monitor and report on labour and OHS performance to the PMU and World Bank on a quarterly basis.
- Support workers' rights to organize and access social security benefits as per Indian law.

6.3 Stakeholder Engagement Plan

Stakeholder Engagement Plan (SEP) has been developed, in accordance with World Bank Environmental and Social Standard 10 (ESS10), to ensure continuous, inclusive, and transparent engagement of stakeholders throughout the project lifecycle. This SEP provides systematic approach and methodology for identification of affected communities, interested parties, and vulnerable groups and outlines tailored engagement strategies and communication approaches. SEP will be disclosed and implemented, from sub-project design stage to implementation, monitoring and project evaluation.

The overall objectives of the stakeholder consultation were:

- to appraise the scope and objectives of the project;
- to identify the expectations and concerns of the community;
- to tap the expertise / wisdom of experts in the field;
- to identify potential issues, concerns, gaps in the planning and opportunities to refine project design;
- gathering information regarding flood vulnerable locations and reasons of flooding in such areas as per the perception of the local people;
- to identify potential environmental and social aspects of the project, problems of the project cycle and proactively design the mitigating measures;
- to ensure stakeholder's acceptability and support for the project'
- to make project successful and sustainable by incorporating inputs, suggestions and concerns.

6.3.1 Categories of Stakeholders

In accordance with ESS10, Project Stakeholder refers to individuals or groups who:

(i) Project Affected Parties:

The term "Project Affected Parties" include those who are affected or likely to be affected, by the project, because of actual impacts or potential risks to their environment, health, security, cultural practices, well-being or livelihoods. For the MRDP, the following individuals and groups fall within the category of Project Affected Parties:

- Farmers and farmer groups and residents of urban settlements living in the PAI
- Community members accessing any impacted public utilities or cultural resources.
- Title Holders (landowners), non-title holders (squatters, encroachers, shopkeepers) and Tenants
- Resident Owners and families
- Resident lessees and families
- Squatters and homeless individuals/families
- Employees of residents

- Individuals and groups engaged with Commercial Entities in PAI
- Shops owners
- Owners of commercial offices
- Street vendors
- Employees and Workers
- Communities impacted by full/partial and permanent/temporary loss of common properties and amenities.
- Citizens affected by disruption of public utilities

(ii) Other Interested Parties

These are individuals/ groups who do not experience direct impacts from the project. However, they are interested in the project due to project location, its characteristics, its impacts, or matters related to the public interest. They need to be kept informed with regular communication and responses to queries. The stakeholders in this category are:

- Officials of KMC, SMKMC, IMC, MKVDC, R&R
- Elected Representatives from Gram Panchayats, Ward Committees, Districts and States
- Community Based Organization of farmers, women's savings and credit groups, shopkeepers,
- Community leaders from project areas
- Resident's Welfare Associations in urban areas
- Civil Society Organizations
- Contractors, Suppliers
- Project contractors/ Consultants
- Project PMU/PIU Staff associate directly or indirectly with the group.
- Local and State Media

(iii)Vulnerable/ Disadvantaged individuals and groups

Within the Project, vulnerable or disadvantaged groups may include but are not limited to the following:

- Communities in Flood Prone Areas
- Non-Title Holders include squatters, encroachers, homeless people living near rivers and urban drains.
- Households below poverty line.
- Scheduled Tribe Households, including particularly vulnerable tribes (PVTG)
- Scheduled Castes Households
- Elderly people
- Persons and Households with disabilities
- Women-headed households,
- Sexual orientation and gender minorities,
- Children Tenant Farmers
- Women Farmers
- Migrant Farm Labour working in agriculture and plantation

- Women led MSME.

6.3.2 Principles for Stakeholder Engagement:

The stakeholder engagement process will follow best practices based on the following principles:

- **Openness and Life-Cycle Approach.** Public consultations will be conducted openly throughout the project lifecycle, free from external manipulation or coercion. This ensures that stakeholders are engaged at all stages of the project.
- **Informed Participation and Feedback**: Information is widely distributed among stakeholders in an accessible format. Opportunities are provided for stakeholders to communicate their feedback, which is then analyzed and addressed.
- **Inclusiveness and Sensitivity.** Stakeholder identification supports better communication and relationship-building. The consultation process is inclusive, encouraging all stakeholders to participate. Equal access to information is ensured for all stakeholders. Special attention is given to vulnerable groups, including women, youth, elderly, and diverse ethnic groups, to ensure their needs are considered in the selection of engagement methods.

6.3.3 Modes of Engagement with Stakeholders

- Different engagement methods will be used to cover varied needs of the stakeholders. Some of the key modes/tools of stakeholder engagement are listed below:
- Consultations during design as well as implementation of subprojects
- Focus Group Discussion with Disadvantaged and Vulnerable Groups
- Websites
- Public Enquiry and Right to Information Officers Dissemination of Information, Education and Communication Material (Print, AV, social media)
- Grievance Telephone Numbers, Emails and Grievance Redressal Officers
- Public Meetings, Consultations and Information Sharing Sessions.
- Press Releases (Print, Social Media, Cable TV and Radio, SMS)
- Public Notice Boards in Construction Sites and Project Areas
- Joint Site Visits for specific issues/locations, as needed.
- Coordination Committee involving PIU, Contractor, Key Stakeholders and NGOs

6.3.4 Information disclosure

Information discloser will be proactive and ongoing with key project documents. Executive summaries will be translated into local languages and hardcopies distributed at local offices and Gram Panchayats. Regular updates will be provided through public meetings, workshops, social media, print and electronic media, and site displays, especially during active phases of project implementation. Regular stakeholder engagement, feedback, and grievance redressal will ensure transparency, accountability, and continuous improvement, throughout the MRDP lifecycle

6.3.5 Robust Grievance Redress Mechanism (GRM)

Robust Grievance Redress Mechanism (GRM) will be established at multiple levels—State/PMU, PIU, and site—to receive, document, and address complaints from PAPs, workers, and community members.

6.3.6 Brief Summary of Stakeholder Consultations Done

Stakeholder consultations have been carried, in respect of sub-projects, included in Component-1 and Component-2 of MRDP. Broad spectrum of stakeholders comprising of local communities, elected representatives, officers of the line department and NGOs were consulted. Till date 9, formal consultations have been carried out in the project area, the details such as dates, locations, number of participants etc. are provided in Annexure 14.

In every consultation cession, project details were appraised to the stakeholders and perceptions of the stakeholders, regarding likely E &S risks and mitigating measures were captured. Pre-framed questionnaire was used for collecting the feedbacks.

All the consultation sessions were successful in drawing, the perceptions and insights of the stakeholders regarding the proposed sub-projects. By and large the stakeholders were convinced of the benefits of the project and suggested to conduct similar consultations during the implementation phase also.

6.3.7 Gist of the feedbacks received during consultation:

Consultations revealed strong community support for MRDP interventions, particularly those addressing recurrent flooding, inadequate drainage systems, and associated socio-economic disruptions.

The gist of the feedbacks received is tabulated in Table 39 below.

Table 39 Feedback received from stakeholders

Project Component	Feedback / suggestions Received	How Addressed
Component 1: Radhanagari Dam	• Existing automatic gates of Radhanagari dam have cultural heritage and hence they need to be preserved by proper maintenance.	**Accepted** • Considering the sentiments of the people, it has been decided to keep the automatic gates intact and provide additional spillway at adjacent location.
	• Repair the existing river sluices	**Accepted** • Included in the sub-project scope.
	• Restart the dam foot powerhouse	**Not Accepted** • This Hydroelectric station is 69-year-old. Normative life (40 years) is over. Spare parts have become absolute. Due to derating and frequent repairs, economically unviable to run this PowerStation. Conscious decision has already been taken by the generating company, to decommission this PowerStation. New 10 MW capacity power station already commissioned to make use of potential energy of the water. •
	• Remove silt from Radhanagari reservoir and rivers	**Not considered.** • The catchment in thick forest. Silt accumulation rate is very low. As per the assessment, done by Remote Sensing, the silt accumulated in dam is within limit. Further, waterbody, being in WLS, desilting requires permission of NBWL.

Project Component	Feedback / suggestions Received	How Addressed
	• Divert flood water on western side towards sea. This will moderate the intensity of flood.	**Not considered.** • Krishna river is a interstate river. Clause X of Tribunal Award (KWDT-1) do not permit diversion of water outside basin.
	• After commissioning of new spillway, automatic gates will not function frequently. Heritage value will be lost.	**Partially accepted.** • Automatic gates are +65 years old. Its functioning can't be fully relied upon and may endanger the dam or lead to risk of loss of conservation storage. • Revised estimated flood is 76, 693 cusec. Existing surplus capacity is inadequate. Hence, provision of additional spillway is mandatory from dam-safety point of view. • Hence, the request of deleting the provision of additional spillway can't be accepted. However, the operation of automatic gates will be ensured by proper maintenance and designing the ROS.
Component 1: River Works	• Restoration of paleo channels and natural drainage system will moderate the flood severity.	**Principally accepted.** • Effectiveness of proposed interventions, visa-a-vis its cost is being confirmed, on mathematical model and after that it will be included in river interventions.
	• Heavy approach embankments of the of the high-level bridges are obstructing the river flow and exacerbating flood risks. • Additional waterways need to be provided by pushing the boxes through such embankments.	
Component 1: Early warning system	• Need for improved flood forecasting and early warning system.	**Accepted.** • System under designing.
Component 1: Upgradation of Real Time Data Acquisition System	• Along with upgradation, it is necessary to provide additions rainfall stations in free catchment as the contribution of free catchment was substantial in flood event of 2019	**Accepted.** • Bidding document under process and necessary provisions are being done.
	• Existing RTDAS device, installed in 2012, have been technologically obsolete.	
	• GSM / GPRS modems based on 2G/ 3G networks are leading to data transmission failures.	
	• RTDAS is required to be provided at newly proposed additional spillway of	

Project Component	Feedback / suggestions Received	How Addressed
	Radhanagari dam and Dhamni dam.	
	• Out of the 3 servers in the data center, 2 are outdated (procured in 2012).	
	• RTSF system experiences slowdowns.	
Component 1: Water conservation works in free catchment	• During the 2019 flood event, contribution of free catchment was significant. Hence, Water conservation works needs to be implemented in free catchment, in mission mode.	**Accepted.** The bids are called for survey investigation and preparation of DPR for the desilting of existing water storage structures and construction of new water storage structures in the free catchment.
Component 2: Urban Stormwater drainage systems in 3 municipal corporations	• During 2019 flood event, water from Kalamba tank side entered into the Kolhapur city. Therefore, catchment upstream of Kalamba tank needs to be treated.	**Accepted.** • Necessary city specific provisions have been made in the DPR and the bid document for construction of Storm Water Drainage system of respective corporations.
	• Outlets of Rankala tank in Kolhapur city needs to be made operative. These outlets can be utilized for emptying the tank before monsoon and using the tank capacity for flood moderation.	
	• Shenda park K.T. weir in Kolhapur is damaged. It needs to be repaired, and its capacity needs to be increased.	
	• The existing capacity of culverts in the storm water drainage system is inadequate.	
	• Natural drains have been blocked due to disposal of solid waste. It needs to be cleared.	
	• In Sangli Ward no.10, CD works constructed by railway authority is inadequate.	Railway authority is requested to increase the waterway of the CD works.
	• Strict prohibition of development within the flood lines and encroachments on the natural drains.	**Accepted.** Will be implemented through appropriate administrative instruments.

Project Component	Feedback / suggestions Received	How Addressed
	• Entry of backwater of the river, during flood in the city storm water drains.	**Accepted.** • River interventions are being designed, considering this aspect.
	• Inadequate waterways of the culverts, missing links in the storm-water system.	**Accepted.** • Considered in the sub-project scope;
	• Blockage of natural drains, due to garbage dumping are the main reasons behind urban flooding.	**Accepted.** • Will be addressed through implementation of robust solid waste management (not a part of MRDP)
	• Likely Social impacts, during construction such as disruption of traffic, risk of accidents noise and dust pollution, interruption in services during utility shifting, unplanned dumping of construction debris needs to be addressed by designing suitable mitigating measures.	**Accepted.** • Safeguard measures included in ESMP & integrated with bidding documents.
	• The impacted people are not ready for displacement	Alignment, of stormwater system is so finalised that it does not require any land acquisition or displacement.

6.4 SEA/SH Action Plan

SEA/SH Action Plan for MRDP

1. Objective of SEA/SH Action Plan for MRDP

To prevent and respond to risks of Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) associated with MRDP civil works, ensuring a safe and respectful environment for all project stakeholders, especially women, children, and vulnerable groups.

2. Key Components

A. Risk Assessment

Conduct a SEA/SH risk screening for each sub-project site. Identify high-risk zones based on worker influx, proximity to vulnerable communities, and lack of oversight.

In MRDP, GBV risks are primarily driven by project interventions that involve civil work, labor influx, and close interaction between workers and local communities. Activities such as the construction of flood control infrastructure, stormwater drainage systems, and landslide mitigation measures will require mobilization of workforce, including migrant laborers who may reside in temporary camps near project sites. This labor influx, combined with the proximity to vulnerable populations—particularly women, adolescents, and children—increases the risk of gender-based violence, sexual exploitation, and harassment (SEA/SH). The risk is further amplified in settings where there are

inadequate facilities for women, limited awareness of GBV issues, and insufficient reporting and response mechanisms.

Sub-project specific SEA/ SHH risk assessment exercise has been done. This exercise reveals that,

Sub-projects involving civil works related to Radhanagari dam, Civil works related that :

(i) river training works, new water storage works, landslide mitigation works, urban storm water works have Substantial SEA/ SH risks.

(ii) Civil works related to maintenance of existing water storage structures in free catchment has moderate SEA/ SH risks.

(iii)Digital intervention based sub-projects / capacity building sub-projects / feasibility studies have low SEA/ SH risks.

To address these risks, the MRDP ESMF includes GBV prevention and mitigation strategy across all project phases. Subproject screening is conducted to identify specific SEA/ SH risk factors related to labor influx and community proximity. The findings will be integrated into the Environmental and Social Management Plan (ESMP). Inclusive consultations with women and vulnerable groups are prioritized to ensure that their concerns inform mitigation measures.

B. Code of Conduct

- Develop and enforce a Code of Conduct (CoC) for all workers, contractors, and project staff.
- Include clear prohibitions against SEA/SH, with consequences for violations.
- Ensure CoC is signed and explained during induction.
- Make the Codes of Conduct (CoC) mandatory, prohibiting SEA/SH, by incorporating necessary provision in the bidding documents and ensure its implementation with regular training and strict enforcement. The Contractor's ESMP (C-ESMP) outlines site-specific actions such as the provision of gender-segregated facilities and safe transportation for female workers.

C. Awareness and Training

- Conduct mandatory SEA/SH training for all project personnel, including contractors and laborers.
- Organize community awareness sessions to inform local populations about their rights and reporting mechanisms.
- Use culturally appropriate materials in Marathi and local dialects.

D. Grievance Redress Mechanism (GRM)

- To establish a confidential, survivor-centered GRM for GBV/ SEA/SH complaints.
- To ensure multiple entry points for reporting (e.g., helpline, local committee, anonymous drop-box).
- To train GRM staff in gender sensitivity and survivor support.
- To ensure timely response and referral to appropriate services (medical, legal, psychosocial).

An accessible, confidential Grievance Redress Mechanism (GRM) has been established, offering multiple reporting channels and trained staff to handle GBV complaints. Continuous monitoring—through indicators like CoC signatories, training completion, GRM usage, and regular site visits—ensures accountability. Collaboration with local GBV service providers and the integration of GBV requirements and budget allocations into bidding documents further reinforce the project's

commitment to safeguarding against GBV risks associated with its interventions. The key actions are summarized below:

- To conduct GBV risk screening and integrate findings into the ESMP, with inclusive consultations to identify and prioritize mitigation measures.
- To share project risks, Codes of Conduct, and grievance mechanisms in local languages through community outreach and accessible communication channels.
- Require contractors to adopt, enforce, and train all workers on Codes of Conduct prohibiting SEA/SH.
- To specify site-specific GBV prevention actions in the Contractor's ESMP, including provision of gender-segregated facilities and safe transportation.
- To establish an accessible, confidential Grievance Redress Mechanism with multiple reporting channels and trained staff.
- To monitor GBV mitigation through indicators such as CoC signatories, training completion, GRM usage, regular site visits, and quarterly reports.
- To collaborate with local GBV service providers and integrate all GBV requirements and budget allocations into bidding and contract documents.

To align with the Environmental and Social Commitment Plan (ESCP) and World Bank safeguards, the ESMF should explicitly include:

- A SEA/SH Risk Assessment Summary, justifying the rating and identifying hotspots.
- A commitment to prepare and implement a SEA/SH Action Plan prior to civil works.
- Integration of contractual obligations for contractors and sub-contractors, including: Codes of Conduct, Worker training and induction, SEA/SH response mechanisms and Establishment of safe and confidential grievance redressal systems.
- Coordination with District Legal Services Authorities, Women's Helplines, and local NGOs for survivor support. Map and establish referral pathways to local health centers, police, legal aid, and counseling services.
- Partner with NGOs and women's organizations for survivor support and community outreach.

E. Contractor Management

- Include SEA/SH prevention clauses in bidding documents and contracts.
- Require contractors to designate a SEA/SH focal point.
- Monitor contractor compliance through regular audits and site visits.

F. Monitoring and Reporting

- Develop SEA/SH indicators for inclusion in project monitoring systems.
- Conduct quarterly reviews of SEA/SH mitigation measures.
- Report incidents and responses in safeguard compliance reports to the PMU and World Bank.

7 SUB-PROJECT LEVEL E&S RISK MANAGEMENT PROCEDURES / PLANS

7.1 Environmental and Social Due Diligence (ESDD)

7.1.1 Introduction

ESDD is a systematic process conducted for identifying the E&S risk involved in the project or sub-project. The outcome of ESDD will determine the level of risks involved and mapping the ESS triggers. ESDD will facilitate designing appropriate safeguard measures.

7.1.2 Objectives

The objectives of ESDD are:

- Identify E&S legacy risks and liabilities;
- Check compliance with laws and ESF requirements;
- Assess reputational, operational and financial risks;
- Support risk categorization and designing appropriate safeguard measures.

7.1.3 Scope of Due Diligence

PIUs, with the assistance of Environmental and Social Safeguards Specialist of Project Management Technical Consultancy (PMTC) shall carry out due diligence of the sub-project, during planning as well as implementation phase. This will include:

- Site inspection, environmental and social screening using checklists designed to suit the nature of the sub-project and activities involved;
- Stakeholder consultation;
- Risk identification;
- Mapping of ESS triggers;
- Designing appropriate safeguard measures;
- Developing formats for regular supervision/monitoring and reporting on E&S issues;
- Undertaking regular site visits/ inspections of the project sites to monitor compliance with Environmental and Social Management Plan (ESMP);
- Pursue and follow the ESMF/ESMP approved by the World Bank, monitor and supervise the environmental protection measures undertaken to mitigate environmental impairment due to construction activities at project sites and disposal site;
- Liaise with the local stakeholders for smooth implementation;
- Preparing environment and social audits and training all stakeholders in application of guidelines during planning, designing, implementation;
- Assess compliance with applicable ESS to identify the gaps or non-conformities if any;
- Developing a time bound Corrective Action Plan to address the identified gaps;

- Ensuring timely completion of actions by IAs as stated in the ESCP;
- Collating information and provide a Quarterly Performance Report (QPR) to the client, PMU and the World Bank and upload the same on MIS;
- Monitoring implementation of stakeholder engagement plan and functioning of grievance redressal mechanisms;
- Based on the guidance provided in the ESMF, assisting the implementing agencies in conducting regular external auditing on the implementation of environmental and social mitigation measures;
- Preparation and submission of Environmental and Social Due Diligence (ESDD) report;
- Disclosure of ESDD Report and any corrective actions to the relevant stakeholders;
- Monitoring and implementation of the corrective actions and generating the progress report;
- Liaising with all relevant stakeholders with specific emphasis on vulnerable and disadvantaged groups including indigenous groups and other marginalized sections in respect of ensuring their inclusion in project activities and support efforts towards their livelihood restoration/ generation;

7.1.4 Contents of the ESDD Report

The standard template for ESDD Report is provided in Annexure 15.

7.1.5 Integration with Project E&S Instruments

Findings from the ESDD process will be integrated into the overall Environmental and Social Management Plan (ESMP) or other relevant instruments to ensure consistency and accountability.

7.2 Environment and Social Management Plan (ESMP)

To the extent feasible, all potential impacts and risks will be avoided through design changes and implementation plans. If avoidance is not possible – measures will be taken to minimize the magnitude of the impact. Subproject specific and site specific ESMPs will be prepared in order to address all the identified potential environmental and social impacts and risks following the principles of the mitigation hierarchy. The ESMP will detail (i) the measures to be taken during the implementation and operation of a project to eliminate or offset adverse environmental and social impacts or to reduce them to acceptable levels; and (ii) the actions needed to implement these measures.

Compensation measures will be proposed if the residual impacts are still significant even after applying the mitigation measures. Further, enhancement measures will be proposed to increase the benefits of positive impacts. An environmental monitoring plan will also be prepared in the ESMP to monitor the effectiveness of the mitigation measures and compliance with the environmental standards.

Subproject specific and site specific ESMPs for project activities will include provisions for addressing risks relating environmental, health & safety aspects; construction debris, solid and other waste management; gaseous pollutants and noise generation from DG set, construction machines and vehicle movement for transporting construction materials; air, water noise pollution control; pollution prevention and environmental quality management, health and safety of project workers and nearby community, any risks of labour influx, such as communicable and non-communicable diseases;

construction and workers camp management, construction site management, work zone safety, traffic management, etc. for each sub project. This will be site specific ESMP for subprojects identified as low to moderate risk (as per E&S Screening). Generic ESMPs for civil works for restoration and enhancement of river-cross section, drainage, landslide mitigation, roads, are given in separate ESMP.

7.3 Resettlement Action Plan (RAP)

Respective PIU will prepare Resettlement Action Plan (RAP), for each sub-project which involves involuntary land acquisition, restrictions on land use and involuntary displacement, physical or economical or both. This RAP document will be consistent with the provisions in the Resettlement Policy Framework (RPF).

Procedure to be adopted for Preparation of RAP

RAP will be prepared following a structured process, consistent with the Resettlement Policy Framework (RPF) and World Bank ESS5 standards. The process followed includes:

- Stakeholder identification and stakeholder consultations;
- Transect walks through project area;
- Assessment of likely environmental and social impacts;
- Finalisation of alignment,
- Census Survey (100%) and Baseline Socio Economic Study;
- Inventory to identify losses suffered by PAPs;
- Defining eligibility and entitlements;
- Valuation of affected assets using PWD Basic Schedule of Rates (BSR) without depreciation to ensure replacement cost.
- Defining implementation, monitoring and GRM evaluation methodologies;
- Formulation Grievance Redressal Mechanism (GRM);
- Budgeting of all planned activities.

RAP will include:

- Overview of the project;
- Perceived Positive Impact;
- Perceived Negative Impact;
- Objective and methodology adopted for preparation of RAP;
- Overview of applicable legal framework;
- Gist of the feedback received during Stakeholder Consultation;
- Cut-off-dates;
- Findings of the household level Census Survey and Inventory of affected structures;
- Socio-economic profile of affected families and information on vulnerable groups and persons which need special assistance;
- Eligibility and Entitlement definitions;
- Methodology to be used for valuation and compensation for losses;
- Entitlement matrix;
- Discloser policy;
- Procedures for Delivering Compensation

- Institutional arrangements for implementation of RAP;
- Implementation Planning and schedule;
- Grievance redressal mechanism;
- Methodology for internal monitoring & external evaluation.
- Budget provisions for implementation of RAP;

Disclosure of RAP

The RAP will be disclosed to all stakeholders, including Project Affected Persons (PAPs), through multiple channels to ensure transparency and accessibility. The full RAP document will be made available on the official websites of PIU, PMU and the World Bank.

Grievance Redressal Mechanism

A robust Grievance Redressal Mechanism (GRM) will be established to redress the grievances promptly and transparently. The GRM will operate at the PIU and will be monitored by PMU.

Implementation Arrangements

PMU will oversee compliance, monitor and provide guidance through a Social Development Specialist for the implementation of RAP. An experienced NGO will support PIU in implementation.

Monitoring and Evaluation

Depending on the scale of displacement, an external monitoring agency will look the non-biased implementation of the RAP. All actions of RAP implementation will be aligned with the civil works schedule to ensure timely assistance before displacement.

7.4 Biodiversity Conservation and Natural Resources

Aligned with the World Bank's Environmental and Social Standard 6 (ESS6), the project prioritizes, biodiversity conservation and sustainable resource management while minimizing environmental impacts from infrastructure and development activities. MRDP is committed to the sustainable management of living natural resources and conservation of biodiversity within the project footprint. All conservation efforts will prioritize the project of ancestral lands and customary resources.

Consolidated Maharashtra map with all exclusion areas and project sites, with necessary legends is provided in Figure 5. The sub-projects areas under MRDP are shown in figure 6.

The Project is aligned, in such a way that the critical habitats in Radhanagari Wildlife Sanctuary, Chandoli National Park, Sagareshwar Wildlife Sanctuary and Mayani Bird Sanctuary remains undisturbed. The Chandoli National Park and Mayani Birds Sanctuary are 35 km and 40 km away from the nearest work site. (Figure 6)

The Sagareshwar Wildlife Sanctuary is about 4 km away from Krishna River however, the altitude difference is about 70m. Further, no work in Krishna River is proposed within 10 km radius of the Sagareshwar Wildlife Sanctuary boundary.

Only, project component that lies within 10 km radius from Radhanagari Wildlife Sanctuary is "Construction of additional Spillway". In this particular case, there is a submergence of dam between Wildlife Sanctuary boundary and the work site. Hence, no wildlife corridors are affected. The workspace is in the possession of the Water Resources Department. However, prior permission under the Wildlife (Protection) Act 1972 will be taken. The Biodiversity Management Plan (BMP) will be prepared and shall be included in the bid

document, to minimize ecological disturbances, while wildlife and habitat protection measures will include restrictions on nighttime construction to avoid disrupting nocturnal species. Implementation of BMP shall be monitored by the PIU & PMTC.

Invasive species pose a significant threat to biodiversity in the Kolhapur and Sangli regions. Certain plant species, such as Lantana camara and Parthenium hysterophorus, degrade forested and agricultural lands, while aquatic species like Tilapia and African Catfish threaten local fish populations in the Krishna and Warna Rivers. To combat this, the project will implement early detection and rapid response (EDRR) mechanisms, including mechanical and biological control techniques, community awareness programs, and policy regulations to prevent the spread of non-native species.

The project also identifies construction-related risks, including temporary disturbances from noise, dust, and worker activities. In ecologically sensitive areas like the Panhala hill ranges in Kolhapur, strict environmental guidelines will be followed to prevent soil erosion and maintain vegetative cover. Additionally, to prevent resource exploitation, measures will be enforced to ensure that workers do not harvest forest products or poach wildlife, particularly in buffer zones near Chandoli National Park and Radhanagari Wildlife Sanctuary.

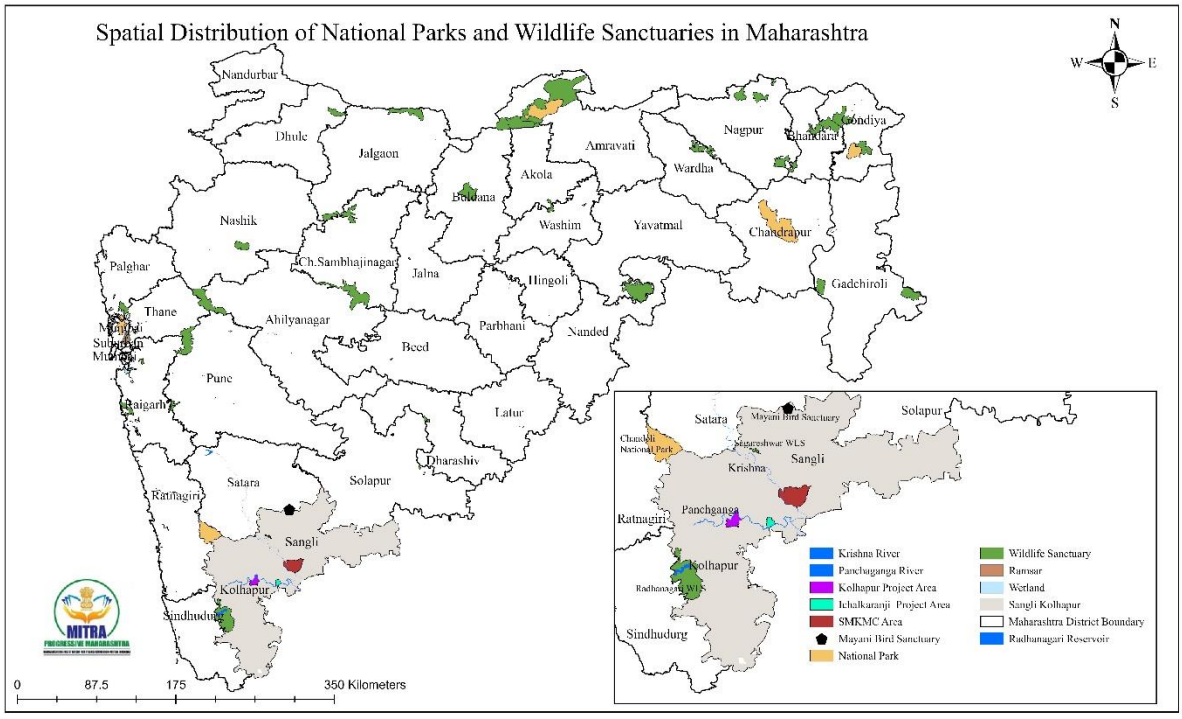

Figure 5: Consolidated Maharashtra Map with exclusion areas and project districts under MRDP

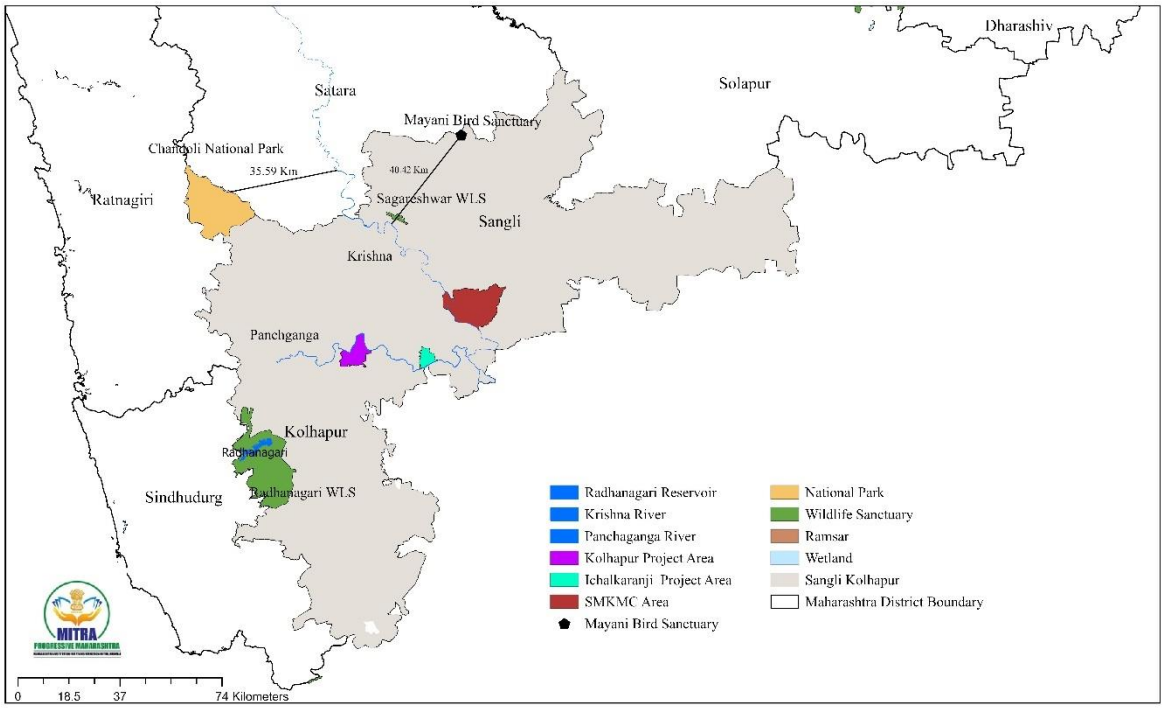

Figure 6: Map showing distance between Eco-sensitive zones and subproject areas under MRDP

7.5 Resource Efficiency and Pollution Prevention and Management

During implementation of MRDP, various resource efficiency and pollution control measures will be implemented. Potential generic risks along with their safeguard measures under Resource Efficiency and Pollution Prevention and Management (ESS3), have been detailed in Annexure 16. These risks include:

- Generation of Spoils/ debris, blocking of natural drains causing stagnation of water leading to mosquito breeding;
- Dumping of hazardous waste;
- Generation of solid waste;
- Generation of dust due to construction activities;
- Increase in carbon footprint, Air pollution (GHG emissions) due to construction equipment;
- Noise pollution due to vehicles, batching plants and equipment;
- Stress on local resources such as additional water consumptions due construction and labour influx;
- Water pollution (wastewater) form the construction sites, labour camps, contamination of bore-wells;
- Increase in river sediment, leading to water quality deterioration and disruptions to aquatic ecosystems, in the river.

Sub-project specific ESMP will be prepared to manage and mitigate the applicable risks.

One of the primary environmental concerns, in river works is sediment management. These river works can increase sedimentation, leading to water quality deterioration and disruptions to aquatic ecosystems, in the river Krishna and Panchaganga. The contractor will be mandated to prepare and implement silt monitoring plan , Consistent with Standard template given in Annexure 8.

The project will implement optimization of the use of construction materials and water resources to ensure sustainability.

In general, the management of generated wastes, shall follow the following steps, namely:

a. prevention;
b. minimization;
c. reuse,
d. recycling;
e. recovery, utilisation including co-processing;
f. safe disposal.

By integrating resource efficiency, pollution control, and climate adaptation strategies, MRDP aims to promote sustainable development in Sangli and Kolhapur while mitigating environmental risks and enhancing climate resilience. Through responsible planning and ongoing monitoring, the program will ensure that infrastructure development aligns with environmental sustainability and long-term ecological balance.

7.6 Traffic Management Plan

The Traffic Management Plan (TMP) under the Maharashtra Resilience Development Program (MRDP) is designed to ensure the safe and efficient movement of vehicles, pedestrians, and machinery within project sites. By identifying potential hazards, implementing control measures, and establishing emergency protocols, the TMP aims to minimize disruptions and create a secure working environment. Given the frequent movement of heavy machinery, materials, and personnel, especially in large-scale infrastructure development projects, effective traffic management is essential to prevent accidents, reduce congestion, and maintain emergency access routes.

A structured traffic management approach is implemented, beginning with project details that define the location, scope, timeline, and operational hours of activities. Traffic control strategies focus on separation of vehicles and pedestrians, ensuring clearly marked routes, designated walkways, and physical barriers to prevent accidents. The use of signage, warning devices, and personal protective equipment (PPE) further enhances site safety, while regular training and supervision ensure compliance with traffic regulations.

The Traffic Management Layout provides a visual representation of traffic control measures, illustrating pedestrian pathways, vehicle lanes, and designated safety zones. This allows for proactive identification of potential conflict areas and risk mitigation strategies. Additionally, communication protocols and emergency procedures ensure that traffic incidents, equipment failures, and injuries are addressed efficiently. A comprehensive list of emergency contacts ensures that site personnel can access assistance promptly.

By implementing a well-structured traffic management plan, MRDP enhances worker and public safety, minimizes environmental impact during construction, and ensures smooth project execution. Through clear guidelines, strategic planning, and proactive monitoring, the TMP plays a crucial role in maintaining safe and organized project sites across Maharashtra.

Walkthrough of Traffic Management Plan

The structure of the sample traffic management plan, which has all the necessary sections that would be required for a real plan to be approved and implemented are as follows:

Project Details

The Project Details section of the sample traffic management plan serves as the foundation, offering essential information that outlines the scope, duration, and specific characteristics of the

project. This information is critical for tailoring the traffic management strategies to the project's unique requirements:

- **Duration of Work:**

Specifies the start and end dates of the project, giving a clear timeline to all concerned. This helps in planning the necessary traffic management measures throughout the project lifecycle. For instance, a project might run from March 4 to March 15, 2024, guiding the scheduling of traffic control measures.

- **Location:**

Details the exact site of the project, including any relevant geographical or environmental considerations that might affect traffic management. A precise location, such as Camden St, Canberra, helps with identifying potential external traffic challenges and planning accordingly.

- **Scope of Work:**

Describes the activities that will be carried out during the project, such as construction of storm water drains, construction of cross drainage works. Understanding the scope is vital for identifying the types of vehicles, machinery, and the volume of pedestrian traffic expected on site, informing the development of detailed traffic management strategies.

- **Hours/Days of Work:**

Outlines the operational hours and days, for example, 8am to 5pm, Monday to Saturday. This information is crucial for designing traffic management plans that address the specific times when traffic will be highest, ensuring that controls are in place during these peak periods.

- **Traffic Control**

The Traffic Control section of the sample traffic management plan is pivotal in delineating how traffic, encompassing vehicles, heavy machinery, and pedestrians, is safely managed on-site. This section is divided into subsections; each addressing a specific aspect of traffic management to mitigate risks and enhance safety.

Separation: Effective separation strategies are essential to ensure that vehicles, pedestrians, and heavy machinery coexist safely. This involves creating distinct pathways and zones for each group, using physical barriers, signage, and clear markings. The aim is to minimise interaction between pedestrians and vehicles, significantly reducing the risk of accidents.

Pedestrian Routes: Pedestrian routes are carefully designed to provide safe, clear pathways for individuals moving around the site. These pathways are separated from vehicle routes and are marked with signs and barriers to guide pedestrians. Ensuring that pedestrians have access to all necessary site facilities without navigating dangerous areas is a priority.

Vehicle Route: Vehicle routes are planned to accommodate the flow of all vehicles on site, ensuring they can move efficiently and safely. This planning includes the designation of specific routes for different types of vehicles, clear signage for directions, and rules to prevent congestion and accidents.

Special consideration is given to ensure that these routes are maintained and free from obstacles that could impede movement

Signs: Signage plays a critical role in traffic control by providing essential information and warnings to both pedestrians and drivers. Speed limits, directional signs, and notifications of restricted areas are strategically placed throughout the site to ensure that all individuals are aware of their surroundings and any potential hazards.

Warning Devices: Warning devices such as flashing lights, alarms, and barriers are employed to alert site personnel to imminent dangers, especially in areas where heavy machinery operates. These devices are crucial in preventing accidents by ensuring that everyone on site is aware of moving vehicles and machinery.

Information, Training, and Supervision: This subsection emphasises the importance of educating site personnel about traffic management policies and safety practices. Regular training sessions, informational materials, and strict supervision ensure compliance with the traffic management plan and reinforce safe practices among all workers and visitors.

PPE (Personal Protective Equipment)

The use of personal protective equipment, particularly high-visibility clothing, is mandated to ensure that individuals are easily seen by drivers and machinery operators. This measure is critical in high-traffic areas and wherever visibility may be compromised.

Vehicles and Drivers

Maintaining vehicle safety is paramount, which includes regular inspections, maintenance, and adherence to safety protocols. Drivers are required to perform pre-use checks and report any issues immediately. This subsection outlines the responsibilities of drivers, and the standards vehicles must meet to operate on site.

Traffic Management Layout

The Traffic Management Layout section of the sample traffic management plan provides a visual representation of how traffic control measures are implemented within the project site. In the sample plan, this section makes reference to the detailed diagram which is attached at the end of the plan. The diagram illustrates the positioning of pedestrian routes, vehicle paths, safety zones, and other critical features necessary for safe navigation and operation. It marks out distinct areas designated for different types of traffic and activities. By presenting a layout, stakeholders can visualise the flow of movement, identifying potential conflict points and the measures in place to mitigate these risks. Here are some key features of the diagram:

● Pedestrian Walkways: Clearly defined and marked paths that ensure safe foot traffic, separated from vehicle routes.

● Vehicle Routes: Designated lanes for vehicles, with clear directions to support smooth flow and minimize cross-traffic interactions.

Communication and Emergency Procedure

The Communication and Emergency Procedure section is designed to articulate clear and efficient communication strategies and to delineate emergency response protocols for the project site:

Communication Protocols

This part details the established channels for ongoing communication among site personnel, including how information on traffic management and immediate updates are shared. It emphasises the importance of clear, timely communication to prevent incidents and ensure swift responses to any changes or emergencies.

Emergency Procedures

This subsection outlines specific procedures for various emergency scenarios, including traffic incidents, injuries, and critical equipment failure. It describes the initial steps to be taken in the event of an accident, such as securing the area, providing immediate assistance, and notifying emergency services. Detailed roles and responsibilities for site personnel during an emergency are defi ned to ensure a coordinated effort in managing the situation.

Incident Management

This subsection provides guidelines for assessing incidents, implementing immediate protective actions, and documenting occurrences for future review and prevention strategies. The aim is to minimise impact, provide for the safety and health of all individuals on site, and ensure compliance with legal and operational requirements.

Emergency Contact Information

A comprehensive list of internal and external emergency contacts, including local emergency services, project management, and safety officers, is included. This list ensures that all personnel know who to contact in various types of emergencies, facilitating rapid and effective response actions.

7.7 ESF Integration in Soft Interventions

7.7.1 Objective

Soft interventions such as feasibility studies, master plans, early warning systems, and risk financing tools will be designed and implemented in alignment with the World Bank's Environmental and Social Framework (ESF), thereby proactively identifying and managing potential environmental and social risks and enhancing sustainability. This will be achieved by, intervention specific E&S risk screening, stakeholder engagements, risk identification, ESS compliance (mapping of triggers from ESS 1 to 10), mitigation and gaps. The standard TOR for carrying out such studies is provided in Annexure 10.

7.7.2 Integration of ESF Principles

A. Terms of Reference (ToR) Development

- Include ESF compliance requirements in ToR.
- Reference relevant Environmental and Social Standards (ESS1–ESS10).
- Require preliminary screening of potential downstream impacts.

B. Design and Analytical Stage

- Analyze screening/baseline data and integrate it in the project design to address the expectations of the stakeholders.
- Assess indirect, cumulative, and long-term impacts.
- Include climate resilience, gender, and inclusion considerations.

C. Output Review and Quality Assurance

- Subject outputs to review by qualified E&S specialists.
- Ensure public disclosure and stakeholder feedback.
- Document on how ESF principles were applied.

D. Monitoring and Adaptive Management

- Define E&S performance indicators.
- Establish feedback loops for updating plans based on evolving risks.
- Recommend institutional arrangements for long-term E&S oversight.

7.7.3 Expected Outcomes

- Environmentally and socially informed planning and decision-making
- Early identification and mitigation of potential risks
- Strengthened institutional capacity for ESF compliance
- Enhanced transparency, accountability, and stakeholder trust

7.8 Integration with bidding documents

PIU will include the following Environmental, Social, Health, and Safety (ESHS) Conditions, in the bidding documents, to ensure all the mitigation measures proposed in the ESMPs are effectively implemented.

- Maintaining qualified and experienced ESHS Staff on site;
- Security against ESHS performance;
- Penalty for default in implementing ESHS measures;
- Observing Code of conduct by Contractor's Personnel/ Labours;
- Management Strategies and Implementation Plans (MSIP) to manage the subprojects' ESHS risks involving large-scale civil works.

It will be the primary responsibility of the contractor to implement the ESMP. PIU will monitor the implementation of the ESMP by the contractor. Penal actions, as provided in the contract will be taken, on failure to implement provisions in the ESMP. The contractor will be asked to quote its rates considering the cost of implementation of ESMP. However, the costs to be incurred on implementation of ESMP will be considered in the cost estimates. The implementation of EMP, by the contractor, during mobilization, construction and demobilization phases, will be monitored by the PIU.

7.9 Contractors ESMP

For subprojects that involve civil works, as a requirement under the bidding documents, the Contractors must submit a Construction Environmental and Social Management Plan (C-ESMP) before their mobilization for PIU approval. This plan will consist of applicable site-specific management plans that will be prepared in compliance with the requirements of the bidding documents, ESMP, and World Bank EHS guidelines:

- Plan for silt monitoring during riverine works (ESS 3); Consistent with Standard template given in Annexure 8;
- Dredged silt Disposal Plan (ESS 3); consistent with Sampling, Testing & Disposal SOP given in Annexure 9;
- Wastewater discharges management plan;
- Air and noise emissions management plan;
- Hazardous material management and spill control plan;
- Water supply and sanitation management at the worksites and workers' accommodations;
- Management of labour influx and facilities for the migrant workers;
- Labour recruitment procedures and labour management;
- Traffic management plan;
- Training plan for OHS and CHS risks, including HIV/AIDS, sexual exploitation and abuse / sexual harassment;
- Emergency Response Plan;
- Grievance Redress Mechanism;
- Demobilization plan after completion of works.

7.10 Compliance Monitoring and Reporting

The overall responsibility for ESMP and RAP implementation under the Maharashtra Resilience Development Project (MRDP) rests with the Project Implementation Units (PIUs), assisted by the Project Management Technical Consultancy (PMTC). At construction sites, the Environmental, Social, Health, and Safety (ESHS) staff of the Contractor are responsible for implementing the ESMP, while the environmental and social specialists of the PIU / PMTC oversee the monitoring of ESMP implementation throughout the project lifecycle.

Compliance monitoring involves on-site inspections of construction activities to verify that the measures outlined in the ESMP and incorporated into contractor clauses are being effectively implemented. This monitoring is akin to standard technical supervision, ensuring that contractors meet the required standards and quality of work.

The PIUs hold the ultimate accountability for ESMP implementation, but day-to-day execution at construction sites is managed by the contractor's ESHS personnel. The PIU specialists conduct regular monitoring to ensure adherence to environmental and social safeguards. For each subproject, specific reports related to ESMP implementation and compliance monitoring are prepared and disclosed on the websites of the respective implementing agencies, promoting transparency and accountability.

Key Reports for ESMP Monitoring and Compliance

- **ESHS Monitoring Report**
  - **Contents:** Compliance status with environmental and social mitigation and monitoring measures, including environmental incidents, health and safety incidents, and health and safety supervision.
  - **Frequency:** Monthly
  - **Prepared by:** Contractor

- **Contractor's ESMP (C-ESMP) Report**
  - **Contents:** Site-specific ESMP implementation status, corrective actions for non-compliance, and updates on mitigation measures.
  - **Frequency:** Within 15 days from contract signing and as updated
  - **Prepared by:** Contractor
- **Occupational Health and Safety (OHS) Plan Report**
  - **Contents:** OHS compliance, incidents, and implementation of safety protocols.
  - **Frequency:** Within 15 days from contract signing and as updated
  - **Prepared by:** Contractor
- **Traffic Management Plan (TMP) Report**
  - **Contents:** Status of traffic management measures and compliance with TMP requirements.
  - **Frequency:** As required
  - **Prepared by:** Contractor
- **Incident Reports**
  - **Contents:** Details of all environmental, health and safety, and social incidents (including pollution events, accidents, and SEA/SH allegations), initial investigation, and detailed follow-up.
  - **Frequency:** Initial report within 24 hours; detailed report within 10 days
  - **Prepared by:** Contractor
- **Monthly/Site Inspection Reports**
  - **Contents:** Results of daily/weekly site inspections, checklist completion, non-conformances, and corrective actions taken.
  - **Frequency:** monthly
  - **Prepared by:** Contractor and PIU
- **Quarterly ESMF/ESCP Compliance Reports**
  - **Contents:** Consolidated information from monthly reports, summary of compliance status, trends, and corrective actions.
    - ESMF Implementation
    - ESCP Compliance
    - ESMP Implementation
    - Summary of grievances received, actions taken, and status of resolution.
    - Disclosure
    - Incidents and Fatalities
    - Stakeholder Engagement
    - ESS Mitigation Plans/Framework
  - **Frequency:** Quarterly and semi-annual

- **Prepared by:** PIU Environmental & Social Specialists/PMU

- **Annual Environmental and Social Audit Reports**
  - **Contents:** Independent third-party evaluation of overall ESMP compliance and effectiveness.
  - **Frequency:** Annual
  - **Prepared by:** Third-Party Auditor

All these reports will be prepared according to the specified frequency and disclosed on the websites of the respective implementing agencies to ensure transparency and accountability.

7.11 Disclosure

The Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), and Resettlement Action Plan (RAP) for each subproject will be made publicly available on the Project Implementation Unit (PIU) and Project Management Unit (PMU) website. Executive summaries of these documents will be translated into the local language and also disclosed on the PIU / PMU website to ensure accessibility for local stakeholders. Additionally, hard copies of the executive summaries in the local language will be provided at local Project Implementation Unit (PIU) offices and Gram Panchayat offices to facilitate community access. All ESIA, ESMP, and RAP documents will be finalized and approved by the relevant authorities prior to the commencement of the bidding process. Furthermore, all necessary government approvals will be secured during the implementation phase to ensure compliance with regulatory requirements and project transparency.

8 IMPLEMENTATION ARRANGEMENTS

8.1 Implementation Arrangements

State Steering Committee (SSC): The State Steering Committee (SCC) is the apex body responsible for formally approving project investments and coordinating activities across various departments. The SCC ensures that all necessary approvals and clearances for the project are obtained. It meets semi-annually to review project budgets, monitor progress against defined milestones, and review critical findings from audit and evaluation reports. The SCC also provides strategic guidance and direction as needed to support project success. The State Screening Committee reviews, appraises, and endorses subproject proposals before implementation. It ensures that proposed activities align with state and national priorities, comply with project eligibility criteria, and meet environmental and social safeguard requirements. The committee acts as a gatekeeper, screening out ineligible or high-risk activities and providing guidance on project selection, risk mitigation, and resource allocation.

Project Coordination Committee: The Project Coordination Committee is chaired by the Joint Chief Executive Officer, MITRA, and includes key officials from departments such as Environment and Climate Change, Urban Development, Water Resources, MKVDC, MPCB, MWRRA, SDMA, as well as District Collectors, Municipal Commissioners, and Relief and Rehabilitation officials. The committee ensures seamless project implementation by facilitating interdepartmental coordination, resolving high-level issues, and aligning project activities with state development goals. The Joint Secretary, Relief and Rehabilitation Department, serves as the Member Secretary, ensuring effective communication and collaboration.

Project Management Unit (PMU) – Maharashtra Institution for Transformation (MITRA):
The PMU, housed within MITRA, serves as the nodal agency between the World Bank and the PIUs. Led by the Project Director and assisted by the Additional Project Director, the PMU is responsible for overall project management and reporting, coordination with PIUs and line departments, and approval of designs. It supports the preparation of Detailed Project Reports (DPRs), bidding documents, and tendering schedules, and oversees the implementation of climate resilience strategies and project components. The PMU appoints technical assistance consultants, manages safeguard compliance, ensures quality assurance through third-party audits, maintains the MIS, and produces quarterly and progress reports. It is also responsible for financial management, monitoring, reporting, grievance redressal, and ensuring compliance with World Bank requirements.

District Level - At the district level, the respective for Component 1 - District Collectors and Component 2 - Municipal Commissioner will oversee and guide the implementation of project components

Project Implementation Units (PIUs): There are five PIUs under MRDP, each responsible for implementing project interventions within their respective jurisdictions. These PIUs are:

- Disaster Management Department, Relief & Rehabilitation (R&R)
- Maharashtra Krishna Valley Development Corporation (MKVDC)
- Kolhapur Municipal Corporation
- Sangli-Miraj-Kupwad Municipal Corporation
- Ichalkaranji Municipal Corporation

Respective PIU is responsible for preparing DPRs, technical designs, surveys, investigations, procurement, bid evaluation, contract management, financial management, environmental and social safeguards compliance, progress and expense monitoring and reporting to the PMU, coordination with line departments, and grievance redressal.

Project Management and Technical Consultants (PMTC): PMTCs provide specialized technical, managerial, and advisory support to the PMU and PIUs. Their roles include assisting with project planning, procurement, quality assurance, monitoring safeguards compliance and ensuring it being done by the contractor, capacity building, and troubleshooting implementation challenges. They ensure that project activities are technically sound and align with international best practices.

Detailed Project Report (DPR) Consultants: DPR Consultants are responsible for preparing comprehensive and detailed project reports for individual subprojects. Their tasks include conducting feasibility studies, technical and financial analysis, risk assessments, and integrating environmental and social safeguards into project design. These reports form the foundation for project approval and implementation.

Contractors: Contractors are responsible for the physical execution of works as per approved designs, technical specifications, and contract conditions. They are required to implement all environmental, social, health, and safety (ESHS) measures, comply with safeguard requirements, and report regularly on progress and compliance. Contractors coordinate closely with PIUs and are subject to supervision and monitoring by both PIUs and PMTCs.

8.2 Staffing Arrangements for ESMF Implementation

8.2.1 E&S Cell at PMU

The PMU is primarily responsible for overall implementation, coordination, supervision, and reporting. PMU is headed by Joint CEO, MITRA, who is also ex-offcio Project Director for MRDP. E&S cell is proposed at PMU level to support, the Project Director to manage, all environmental & social aspects of the Project, including planning, supervision, monitoring, evaluation, reporting, and documentation. Environmental and Social Specialists at the PMU will lead risk management, conduct training and capacity building for PMU, PIUs, PMTCs, DPR Consultants, and NGOs, and ensure regulatory compliance and integration of the ESMF into project design and contracts. They coordinate with participating agencies, engage additional expertise for components that trigger safeguard policies, and are responsible for the implementation, coordination, supervision, and reporting of the Stakeholder Engagement Plan (SEP), Labour Management Procedures (LMP), Resettlement Policy Framework (RPF), Indigenous Peoples Planning Framework (IPPF), and Environmental and Social Commitment Plan (ESCP). These specialists also coordinate with line departments, support community consultations, oversee data collection, ensure quality and preparation of the IPPF, review monitoring reports from implementing agencies, conduct field visits for compliance monitoring, provide technical guidance, act as focal points for resolving concerns, prepare periodic reports, and oversee ESMF implementation and policy adherence. The PMU staffing pattern, timelines and reporting protocol will be as per Table 40 below:

Table 40: E&S staffing pattern: E&S cell at PMU

Name of the staff	Recruitment Timelines	Reporting to
Senior Environment Safeguards Specialist	Within one month from effective date of the project and it shall be maintained throughout the project implementation	Project Director (MRDP) and E&S Nodal Officer at PMU
Senior Occupational Health and Safety Specialist		
Senior Biodiversity Expert / Advisor		
Senior Social Development Specialist		
Senior Land Acquisition/ Resettlement Specialist		
Senior Community Consultation Specialist		
Nodal Grievance Officer		

8.2.2 Project Implementation Units (PIUs):

The PIUs, including MKVDC, R&R, SMC, KMC and IMC—will designate nodal officers and engage relevant personnel. The PIU Environmental Specialist will assist and guide implementing agencies in preparing and executing sub-projects in compliance with the ESMF, conducts environmental screening, prepares site-specific Environmental Management Plans (EMPs), coordinates with regulatory authorities for clearances, organizes training, builds contractor capacity, reviews consultants' assessments and EMPs, documents progress, and overseas third-party audits. The Social Specialist supports PIU in social aspects of the ESMF, including resettlement and stakeholder engagement, community mobilization, RAP preparation and implementation, timely disclosure, coordination of compensation and resettlement, liaison with authorities, grievance monitoring, monthly progress reporting, contract execution oversight, environmental and social screening, integration into project planning and DPRs, on-site compliance, addressing contractor non-compliance, and periodic updates to the PIU. Together, these specialists ensure comprehensive risk management, compliance, and stakeholder engagement throughout the project lifecycle. PIUs play a major role in stakeholder engagement, with Social Development and Communications experts implementing activities through IEC consultant agencies at the community level, maintaining productive engagement and smooth SEP implementation. Designated Grievance Officers are responsible for recording and redressal of grievances.

8.2.2.1 Staffing pattern for PIU MKVDC

Responsibility of implementation of Component-1 of MRDP is entrusted with Maharashtra Krishna Valley Development Corporation (MKVDC). Works related to Radhanagari Dam has substantial E&S risk and substantial SEA/SH risk. River Training Works and Construction of new water storage structures in the free catchment have substantial E&S and SEA/ SH risk; particularly, river training works and construction of new water storage structures involve land acquisition and related social issues. Considering the sub-project specific environmental and social risk mitigation challenges, E&S staffing pattern is designed and presented in Table 41 below:

Table 41: E&S staffing pattern: PIU-MKVDC

Name of the staff	Recruitment Timelines	Reporting to	Remarks
Environment Safeguards Specialist	Within one month from effective date of the project and will be maintained throughout the project implementation	Project Director (MKVDC), E&S Nodal Officer at PMU and respective experts in E&S cell at PMU.	Already engaged through PMTC
Occupational Health and Safety Specialist			
Biodiversity Expert / Advisor			
Social Development Specialist			Already engaged through PMTC
Land Acquisition/ Resettlement Specialist			
Community Consultation Specialist			Already engaged through PMTC
Grievance Officer		Additional Project Director (MKVDC) and respective nodal officers at PIU level.	
E&S Expert at Field Level	Prior to commencement of works and shall be maintained throughout the project implementation.		
Third Party Monitoring Agency (TPMA)			
NGO for RAP implementation			

In addition to the above-mentioned E&S staff, consulting firms have been appointed for preparation of DPR and Project Management and Technical Consultancy (PMTC) for implementation of works under MKVDC.

E&S Responsibilities Assigned to MKVDC DPR Consultants: The team of consultants appointed for the preparation of DPR comprises of Environmental Safeguards Specialist, Social Safeguards Specialist and Biodiversity Specialist. The specific responsibilities assigned to DPR consultants are:

a) Carry out on site screening of environment and social risks and impacts based on proposed interventions;

b) Undertake systematic consultations with key stakeholders (including experts, departments, and agencies), project affected communities and their elected leaders to solicit their concerns/views after a clear identification and mapping of stakeholders at the screening stage;

c) The consultant will (i) collect information from primary and secondary sources that is relevant to understanding the baseline pertaining to physical, biological/natural and socio- cultural environment; (ii) carry out site visits and detailed field investigations of the Krishna basin and sub-basins, with a focus on the environmentally and socially sensitive locations, (iii) document these to provide inputs, including on any potential conflict points for the preliminary engineering/technical designs; (iv) prepare detailed maps showing details of all proposed investment locations and their surrounding environmental, social and land use contexts.

d) The Consultant shall assess the Environment (including Health and Safety) and Social impacts of the sub-project, with respect to loss of land, structures, crops, livelihoods, trees, forests, open areas, resource use, pollution/construction management, common properties, tangible and

intangible cultural assets (including archaeological structures/features) and other relevant E&S aspects;

e) The Consultant will specifically assess how the project will affect the biodiversity values (both aquatic and riparian), natural and critical natural habitats, riverine ecosystem, species of ecological and conservation significance, protected areas, wetlands, biodiversity hotspots, drainage patterns, community conserved areas/sacred groves and any protected plantation and reforestation areas;

f) The consultant will evaluate the sub-project designs to assess any potential environment and social risks and impacts arising from the proposed interventions, in the context of their relevance to the World Bank's Environment and Social Framework (ESF) and its Standards.

g) The consultant while doing analysis of alternatives shall compare feasible alternatives to the proposed sub-project siting, design, technology selection, construction techniques and phasing and operating procedures - including environmental and social risks and impacts "with project" and "without project" scenarios;

h) Further, the consultant while finalizing the technical designs for each sub-project, shall follow the principle of mitigation hierarchy: Avoid or Minimize or Mitigate or Offset impacts.

i) The results of the assessment shall be documented as a standalone ESIA reports for each sub-project following the suggested structure in Bank's ESF;

j) Prepare communications materials on the draft DPRs that in easy to understand by non-technical audience related to the technical propositions being made;

k) The draft technical designs and draft ESIAs shall be widely consulted with stakeholders and communities, for which a proper plan shall be prepared;

l) Document/record systematically concerns; feedback and suggestions received from stakeholders and communities;

m) Based on the environmental and social impacts assessed, sub-project specific ESMPs shall be prepared that consist of a set of mitigation, monitoring, and institutional measures required to eliminate/address adverse environmental and social risks and impacts. These instruments shall be prepared as per the requirements of WB's ESSs and should identify responses to potentially adverse impacts; determine requirements for ensuring timely responses; and describe the means for meeting those requirements. The technical details for each mitigation measure shall include the type of impact to which it relates, the conditions under which it is required (e.g., continuously or in the event of contingencies), as well as design, equipment descriptions, and operating procedures, as appropriate. ESMP shall provide implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and estimated cost and sources of funds for implementing the ESMP (integrated into the total project/sub-project cost tables).

n) In case of impact on land, structure, loss of livelihood etc, the Consultant will prepare, Resettlement Action Plans (RAPs) as per project's ESMF and RPF. For any impact on tribal population, Indigenous People's Development Plan (IPDP) will also be prepared by the Consultant. ESMP will include all applicable risk mitigation measures related to community

health and safety, construction and traffic management, silt management, as well as gender-based violence prevention;

o) The Consultant shall integrate the ESMP in the bidding documents and the Work's Contracts.

Project Management Technical Consultancy: PMTC comprises of Environmental Safeguards Specialist, Social Safeguards Specialist, Communication / Stakeholder consultation specialist which have already been appointed. PMTCs will assist PIUs and ensure Environmental and Social Due Diligence Compliance. The services of this PMTC will be available to MKVDC PIU throughout the implementation period.

Table 42: Roles and Responsibilities assigned of Environmental and Social Specialists

Position	Institution	Key Responsibilities
Environmental Specialist	PMU	• Lead environmental safeguard planning and compliance; • Review and approve EIAs, EMPs, and screening reports; • Ensure integration of environmental sustainability in project design; • Monitor ESMP implementation across sub-projects; • Coordinate with regulatory bodies for environmental clearances; • Provide technical guidance to PIUs and consultants; • Prepare periodic environmental performance reports;
Social Specialist	PMU	• Oversee social safeguard compliance across all sub-projects; • Conduct and review SIAs, RAPs, and stakeholder engagement plans; • Ensure inclusion of vulnerable groups, gender equity, and tribal engagement; • Guide land acquisition processes and compensation mechanisms; • Monitor implementation of social mitigation measures; • Coordinate grievance redress mechanisms; • Report social performance to PMU and World Bank;
Environmental Specialist of PMTC	PIU	• Developing formats for regular supervision/monitoring and reporting on E&S issues; • Undertaking regular site visits/ inspections of the project sites to monitor compliance with Environmental and Social Management Plan (ESMP); • Pursue and follow the ESMF/ESMP approved by the World Bank, monitor and supervise the environmental protection measures undertaken to mitigate environmental impairment due to construction activities at project sites and disposal site; • Liaise with the local stakeholders for smooth implementation; • Preparing environment and social audits and training all stakeholders in application of guidelines during planning, designing, implementation;

Position	Institution	Key Responsibilities
		• Assess compliance with applicable ESS to identify the gaps or non-conformities if any; • Developing a time bound Corrective Action Plan to address the identified gaps; • Support RAP implementation and community engagement. • Ensuring timely completion of actions by IAs as stated in the ESCP; • Collating information and provide a Quarterly Performance Report (QPR) to the client, PMU and the World Bank and upload the same on MIS; • Monitoring implementation of stakeholder engagement plan and functioning of grievance redressal mechanisms; • Based on the guidance provided in the ESMF, assisting the implementing agencies in conducting regular external auditing on the implementation of environmental and social mitigation measures; • Preparation and submission of Environmental and Social Due Diligence (ESDD) report; • Disclosure of ESDD Report and any corrective actions to the relevant stakeholders; • Monitoring and implementation of the corrective actions and generating the progress report; • Liaising with all relevant stakeholders with specific emphasis on vulnerable and disadvantaged groups including indigenous groups and other marginalized sections in respect of ensuring their inclusion in project activities and support efforts towards their livelihood restoration/ generation;

8.2.2.2 Staffing pattern for PIU KMC / SMKMC / IMC

The implementation of storm water drainage system in 3 municipal corporation jurisdiction viz., KMC, SMKMC and IMC attract substantial E&S and SEA/ SH risk. This component does not involve any land acquisition; however, there will be some minor temporary impacts to the properties, during implementation of storm water drainage system within the jurisdiction of SMKMC and IMC. In respect of KMC, no impact on private properties is expected. Considering the specific, E&S challenges involved, E&S staffing pattern is designed and presented in Table 43 below:

Table 43: E&S staffing pattern: PIU-KMC, SMKMC and IMC

Name of the staff	Recruitment Timelines	Reporting to	Remarks
Environment Safeguards Specialist	Within one month from effective date of the project and will be maintained throughout	Respective Project Director of Municipal Corporation / City Engineer, E&S Nodal	
Biodiversity Expert / Advisor			

Social Development Specialist	the project implementation	Officer at PIU and PMU and respective experts in E&S cell at PMU.	
Community Consultation Specialist			
Grievance Officer			
E&S Expert at Field Level	Prior to commencement of works and shall be maintained throughout the project implementation.		
Third Party Monitoring Agency (TPMA)			
NGO for RAP implementation			For SMKMC and IMC only.

8.2.2.3 Staffing pattern for PIU R&R

PIU R&R is entrusted with implementation of landslide mitigation works and other digital infrastructure works such as construction of DEOC, early warning system, etc. The works related to landslide mitigation attracts substantial E&S and SEA/ SH risk whereas the other digital infrastructure have low E&S and SEA/ SH risk. Accordingly, E&S staffing pattern is designed and presented in Table 44 below:

Table 44: E&S Staffing pattern: R&R Department

Name of the staff	Recruitment Timelines	Reporting to
Environment Safeguards Specialist	Within one month from effective date of the project and shall be maintained throughout the project implementation.	Project Director of R&R, E&S Nodal Officer at PIU and PMU and respective experts in E&S cell at PMU.
Social Development Specialist		
Grievance Officer		
E&S Expert at Field Level		

8.3 Budget for E&S staffing

Staffing provision made above is supported by adequate budgetary provisions, which are given in Chapter 12.

9 GRIEVANCE REDRESSAL MECHANISM

A Grievance Redressal Mechanism (GRM) is established to address stakeholders' grievances and dissatisfactions about actual or perceived impacts and to find a satisfactory solution. Some grievances may arise during the project design and planning stage, while others may come up during project implementation. The GRM will be implemented throughout the project cycle for use by stakeholders to address concerns and complaints promptly and transparently. The GRM will ensure that the stakeholders have access to legitimate, reliable, transparent, and efficient institutional mechanisms that are responsive to their complaints. The GRM will work within existing legal and cultural frameworks, providing an additional opportunity to resolve grievances at the local and sub-project level.

The establishment of a robust Grievance Redressal Mechanism (GRM) is crucial for the successful implementation of the Maharashtra Resilience Development Project (MRDP). An effective GRM ensures that concerns and complaints raised by project-affected people and other stakeholders are addressed promptly, transparently, and fairly. This chapter outlines the comprehensive GRM framework for MRDP. The GRM for MRDP will be integrated within the overall project governance structure, with clear lines of responsibility and accountability at different levels:

The key objectives of the GRM

- To educate stakeholders on the GRM
- To receive and record the grievances
- To resolve and close the grievances
- To escalate unresolved grievances to concerned authority
- To notify/ update the stakeholders of the solutions

9.1 Grievance Redressal Officers and Committees

The Grievance Redressal Mechanism (GRM) is structured across multiple levels to ensure timely resolution of grievances raised by stakeholders, beneficiaries, and affected communities. The GRM follows a hierarchical approach, with grievance redress committees (GRCs) at site-level and Grievance Officers in Project Implementation Units and Project Management Unit (PMU). This ensures an accessible, transparent, and structured process for grievance resolution.

MRDP will have multi-level grievance redress mechanism, PMU Level, PIU level and site level. The project level GRM will be headed by the Project Director (PMU), assisted by Grievance Officer (GO) at PMU who will be responsible for the overall management of the grievance redressal mechanism in MRDP. GO in PMU will be assisted by the social development specialist (PMU). PIU level GRM as a middle-tier, Grievance Officer at PIU level GRM will directly address all grievances related to the project affected persons (PAPs), project workers and community members and all unresolved grievances will be escalated to the PMU level GRM. Site level Grievance Redressal Committees (GRCs) composed of Junior Engineers, community members, elected representatives as well as CSOs as the first level grievance redressal agency.

Additional to the dedicated grievance redress mechanism, MRDP will leverage the existing public grievance mechanism of the Government of Maharashtra, such as the (i) Centralized Public Grievance Redress and Monitoring System (CPGRAMS) and (ii) Chief Minister's Helpline service which has the Toll Free (1800-120-8040) facility. Each of the PIUs also have departmental grievance redressal and tracking mechanisms. However, stakeholder awareness of these mechanisms is low, and the reporting and tracking is weak. Information dissemination on GRMs will be a key activity during the initial phase of project t implementation and continue throughout the implementation period. It is vital that appropriate signage for GRM is erected at the sites of all works providing the public with updated Project information and summarizing the GRM process, including contact details of the relevant nodal officer. Anyone shall be able to lodge a complaint and the methods (forms, in person, telephone, forms written in Hindi/local language/ English) should not inhibit registering any complaint.

9.2 PMU GRIEVANCE OFFICER

(Top-Level Oversight)

Public Relation Officer (PRO) at PMU will be the project grievance officer. PRO will be assisted by Social Development Expert (PMU)

Role & Responsibilities: Grievance Officer

(i) Final resolution (with consent of Project Director) on escalated grievances escalated from PIU-level committees.

(ii) Monitoring the overall effectiveness of the grievance redressal process.

(iii)Ensuring compliance with social safeguards and stakeholder engagement commitments.

Role & Responsibilities: Social Specialist (PMU)

(i) To compile and prepare monthly grievance reports;

(ii) Preparing Status reports of all pending grievances;

(iii)Maintaining records and reports on grievance redress actions.

9.3 PIU GRIEVANCE OFFICER(GO)

(Intermediate-Level Resolution)

Each Project Implementation Unit (PIU) will be assigned Grievance officers who will handle grievances related to their respective jurisdiction. They will serve as the first point of escalation for grievances that cannot be resolved at the site level. Public Relations Officers will be given additional charge of Grievance officers MRDP at PIUs. GOs will be assigned in the following PIUs;

(i) Maharashtra Krishna Valley Development Corporation (MKVDC)

(ii) Kolhapur Municipal Corporation (KMC)

(iii)Sangli-Miraj-Kupwad Municipal Corporation (SMKMC)

(iv)Ichalkaranji Municipal Corporation GRC

(v) Revenue, Relief, and Rehabilitation Department, Government of Maharashtra (GoM)

Grievance officers will work closely with the Social Nodal Officers at PIU and will be assisted by Social Development specialists at PIUs.

Role & Responsibilities:

(iii)Addressing grievances that cannot be resolved at the site level;

(iii)Providing solutions through departmental coordination;

(iii)Escalating complex cases to the PMU GO for further review.

9.4 Site-Level Grievance Redress Committees

At the ground level, Site-Level GRCs act as the first point of contact for grievances raised by affected individuals or communities. Respective junior engineer will be assigned as the convenor for the GRC and will be responsible for the overall coordination of the grievances at Project Works site.

Composition:

(i) Junior Engineers

(ii) Community members

(iii)Elected representatives

(iv)Civil Society Organizations (CSOs)

(v) Contractors

Role & Responsibilities:

(i) Receiving and documenting grievances from local communities;

(ii) Attempting to provide on-the-spot resolution whenever possible;

(iii)Referring unresolved cases to the PIU-level GOs;

(iv)Engaging with the local population through consultations and awareness programs;

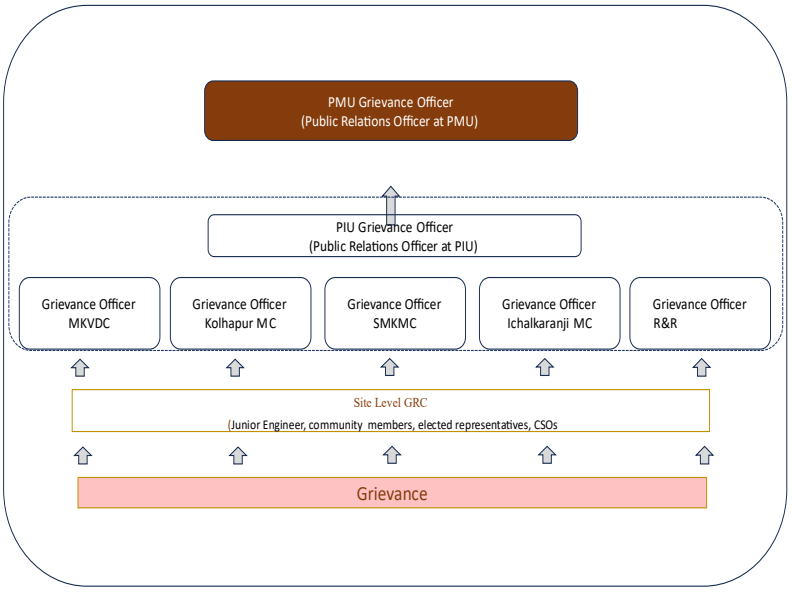

Figure 7: Representation of Project level Grievance redressal mechanism

9.5 Grievances related to GBV/ SEA

To address complaints related to GBV/ SEA, the implementing agencies are mandated to constitute Internal Committee (IC) as per provisions contained in Section 4 of the Sexual Harassment of Women at Workplace (Prevention, Prohibition & Redressal) Act 2013, at headquarters as well as division / district level.

9.6 Channels for Submitting Grievances

Aggrieved stakeholder will be able to submit their grievances through the following project-specific channels

(i) Through dedicated helpline number under MRDP

(ii) Writing directly to Grievance Redressal Officers

(iii) Through Grievance Redressal Committees

(iv) Through PMU and PIU Websites and Emails

(v) Through PMU and PIU Grievance Telephone Numbers

PIU will document the grievances received in a format given in Annexure 12 and Annexure 13.

9.7 Existing district and PU level channels

Grievances could also be submitted to PIU's directly as per the table given below.

Table 45: Grievance Redressal Mechanism at PIU level

Steps	Description of process	Time frame	Responsibility
Grievance Uptake	Grievances can be submitted via Toll-free - 14420 IVRS for streetlights - 8956161508 SMS - 7066040330 Email - smkcorporation@gmail.com, commissionerkmc@rediffmail.com Webportal - https://smkc.gov.in/index.aspx Letters addressing to Hon.Commissioner SMKC, KMC, IMC Complaint forms to be lodged via any of the above channels - PDF of Complaint (Online form Attached Annex-ABC) Walk-ins may register a complaint in a grievance logbook at (All Concern Department maintain Grievance Book) Sample attached	3 to 7 days	Public Relation Officers of concern PIU

Steps	Description of process	Time frame	Responsibility
Sorting and Processing	Any complaint logged is forwarded to (Concern Department) and categorized according to the following complaint types. 1. Department Type - Complaint Type - Area	3 to 7 days	PRO Municipal Corporation
Acknowledgement and follow up	Receipt of grievance is acknowledged to the complainant by (modes of acknowledgement - SMS/email receipt etc) For online complaint SMS and email. For Letter - receipt / received copy	Same day	PRO Municipal Corporation
Verification, Investigation, Action	Investigation of complaint is led by (officers appointed), A proposed resolution is formulated by (nodal officer position), and communicated to the complainant by (mode of communication). 1. Site Visit 2. Tele communication 3. Reply online 4. Letter	3 to 7 days	Public Works **Level 1** Junior Engineer Review and address the grievance, and provide an updated resolution report **Level 2** Deputy Engineer Understand the issue from level and directed him to take action **Level 3** Executive Engineer Final review and directed Jr. Engineer as well Dy. Engineer to take immediate action within given SLA period **Health and Sanitation** - Sanitation Inspector **Water Supply and Drainage**- Junior Engineer **Electricity** - Light Engineer **Encroachment** - Junior Clerk MC Commissioner is the final level of escalation in all areas
Monitoring and Evaluation	Data on complaints are collected in (description of format/ name of MIS tool) 1. Complaint Book – Offline 2. GRC sheet – Offline	Monthly Ongoing process	Commissioner office, PRO municipal corporation

Steps	Description of process	Time frame	Responsibility
	3. Dashboard for online complaint online		
Provision of feedback	Feedback from complainants regarding their satisfaction with complaint resolution is collected through (modes of collecting feedback on complaints) 1. Online 2. Complaint Book - offline	Ongoing process usually within a week of resolution provided	
Training	Training requirement (if any) at PIU Level	ESSA 10	PMU&PIU

9.8 Integration with Project-Specific GRM

The MRDP will establish clear protocols for integration with existing state mechanisms:

1. Coordination Mechanisms: Formal agreements between the PMU and relevant state departments for:
    - Sharing grievance data
    - Defining jurisdiction and responsibility
    - Establishing referral pathways
    - Joint monitoring of resolution status
2. Technology Integration: Where feasible, the project GRM database will be interoperable with existing state systems to enable seamless transfer of grievances and tracking of resolution across platforms.
3. Training for Government Officials: Officials from relevant departments will receive orientation on the project GRM to facilitate integration and collaboration.
4. Unified Reporting: Consolidated reporting that captures grievances handled through both project-specific and existing government mechanisms to provide a 37. Integration with Stakeholder Engagement Plan: The GRM will be a central component of the project's overall stakeholder engagement plan, ensuring consistent messaging and approach.

The MRDP Grievance Redress Mechanism (GRM) is designed as a multi-tiered, accessible, and transparent system to ensure timely and fair resolution of grievances raised by stakeholders, beneficiaries, project-affected people (PAPs), workers, and community members. The GRM operates at three levels: Site-Level, Project Implementation Unit (PIU) Level, and Project Management Unit (PMU) Level, with escalation possible at each stage. The mechanism is guided by principles of accessibility, inclusivity, transparency, accountability, impartiality, cultural sensitivity, timeliness, and confidentiality, ensuring that all grievances are addressed fairly and efficiently.

Site-Level Grievance Redress Committees (GRCs) are composed of representatives from line agencies, community members, elected representatives, civil society organizations (CSOs), and contractors. These committees serve as the first point of contact for grievances raised by affected individuals or communities. Their primary role is to receive and document complaints, attempt to provide on-the-spot resolution whenever possible, and refer any unresolved cases to the PIU-level GRCs for further action.

PIU-Level Grievance Redress Committees (GRCs) operate as the intermediate resolution tier within the grievance redressal structure. Their composition includes the Commissioner or Additional Commissioner for municipal corporations, the Director of Relief & Rehabilitation for the Revenue Department, the Nodal Officer for Social Development, the Public Relations Officer, Directors or Deputy Directors of relevant line departments, and other officers as needed. These committees address grievances that cannot be resolved at the site level, provide solutions through departmental coordination, and escalate complex or unresolved cases to the PMU Grievance Redress Committee for further review.

The PMU Grievance Redress Committee (Top-Level Oversight) is composed of the Project Director, Deputy Project Director, Social Development Expert, and Public Information Officer. This committee provides the final resolution for grievances that have escalated from the PIU-level committees. It is responsible for monitoring the overall effectiveness of the grievance redress process, ensuring compliance with social safeguards and stakeholder engagement commitments, and maintaining comprehensive records and reporting on grievance redress actions.

In addition to these dedicated grievance redress committees, the MRDP GRM leverages existing government grievance systems, such as the Centralized Public Grievance Redress and Monitoring System (CPGRAMS) and the Chief Minister's Helpline, as well as departmental mechanisms at each PIU. These systems are integrated to ensure comprehensive coverage and accessibility for all stakeholders, allowing for multiple avenues through which grievances can be raised and addressed.

Flow for Submitting Grievances: The main channels for submitting grievances are:

- Writing directly to Grievance Redressal Officers;
- Submitting through Grievance Redressal Committees;
- Using PMU and PIU websites and emails;
- Calling PMU and PIU grievance telephone numbers;
- Submitting complaints via CPGRAMS or the Chief Minister's Helpline (Toll-Free: 1800-120-8040).
- In-person, by phone, or using forms in Hindi, Marathi, or English.

The **Aaple Sarkar Grievance Redressal Portal** allows citizens to submit grievances without mandatory personal identification, enabling anonymous reporting. SEA/SH-related grievances are treated with confidentiality and sensitivity and routed to appropriate authorities such as the District Women and Child Development Office, Police Protection Cells, and Legal Services Authorities.

Projects aligned with the Environmental and Social Commitment Plan (ESCP) and World Bank safeguards will ensure that GRMs are SEA/SH-responsive, including:

- Dedicated focal points for SEA/SH;
- Survivor-centered protocols;
- Referral pathways to medical, legal, and psychosocial support;

PIU shall prepare subproject specific abstract of grievance redressal quarterly in a format given in Annexure 13 and submit it to PMU.

10 MONITORING & REPORTING

Effective monitoring and reporting of environmental and social safeguards constitute a critical aspect of project implementation to ensure compliance with the World Bank's Environmental and Social Framework (ESF) and national regulations. This chapter outlines the comprehensive monitoring and reporting mechanisms for the Environmental and Social Management Framework (ESMF).

10.1 Institutional Arrangement for Monitoring and Reporting:

The institutional arrangement for ESMF monitoring and reporting is designed to ensure systematic observation, documentation, and communication of environmental and social safeguards throughout the project lifecycle. Maharashtra Institution for Transformation (MITRA), as the Project Management Unit (PMU), holds the primary responsibility for overseeing monitoring and reporting activities across all implementing agencies. The structure encompasses multiple levels of oversight and accountability to facilitate effective implementation of the ESMF. The monitoring and reporting structure follows a hierarchical approach with clearly defined roles and responsibilities. At the apex level, MITRA coordinates with various Project Implementation Units (PIUs) including the Disaster Management Department, Relief & Rehabilitation (R&R), Maharashtra Krishna Valley Development Corporation (MKVDC), and participating municipal corporations (Kolhapur, Sangli-Miraj-Kupwad, and Ichalkaranji). Each PIU designates an Environmental and Social Safeguards Officer (ES experts) responsible for day-to-day monitoring of ESMF implementation within their jurisdiction. This structure ensures comprehensive coverage of all project activities while maintaining consistent approaches to environmental and social risk management. The ES experts at each PIU report to the Environmental and Social Management Unit (ESMU) at the PMU level, which consolidates information and provides strategic guidance.

10.2 Technical Support and Oversight

To enhance the effectiveness of monitoring and reporting, the project will establish partnerships with technical agencies, academic institutions, and non-governmental organizations. World Bank supervision missions provide an additional layer of oversight, with environmental and social specialists conducting periodic reviews of safeguards implementation. These missions verify compliance with the ESMF provisions, identify emerging issues, and recommend corrective actions as needed. The findings from these missions inform subsequent planning and implementation strategies, ensuring continuous improvement of safeguards management. An independent Third-Party Monitoring Agency (TPMA) will be engaged to conduct periodic assessments of ESMF implementation and provide impartial verification of compliance with environmental and social requirements.

10.3 Monitoring Framework and Indicators

The monitoring framework for the MRDP ESMF adopts a comprehensive approach covering environmental, social, health, safety, and labor aspects. The framework emphasizes both compliance monitoring (adherence to regulatory standards and procedures) and impact monitoring (assessment of actual environmental and social outcomes). The indicative list of indicators is summarized below.

10.4 Core Institutional ESF Indicators for MRDP

The core institutional ESF indicators for MRDP are mentioned below:

10.4.1 Environmental and Social Risk Assessment and Management:

- Number and quality of Environmental and Social Impact Assessments (ESIAs) and Environmental and Social Management Plans (ESMPs) prepared and implemented for flood, riverine landslide, and urban flood resilience subprojects.
- Frequency of risk screening and timely updates to mitigation measures across all MRDP components (flood risk management, multi-hazard resilience, emergency management, risk financing, and knowledge management).
- Regular submission of monitoring and implementation reports by PIUs and PMU to the World Bank, including incident and compliance updates1.

10.4.2 Labor and Working Conditions:

- Percentage of contractors and project entities compliant with Indian labor laws and ESS2 requirements.
- Number of workers trained in occupational health and safety (OHS) and gender-based violence (GBV) prevention.
- Functionality and usage of worker grievance mechanisms, including number of grievances registered and resolved.

10.4.3 Resource Efficiency and Pollution Prevention:

- Compliance with resource efficiency targets (water, energy) and pollution control standards at all MRDP sites.
- Monitoring and reporting of pollution incidents, waste management, and emissions from green and grey infrastructure investments.

10.4.4 Community Health and Safety:

- Number of community health and safety incidents reported and addressed, especially in flood-prone and landslide-affected areas.
- Implementation and testing of emergency response plans at project and community levels.

10.4.5 Land Acquisition and Resettlement:

- Percentage of affected persons compensated and resettled as per ESS5 and national laws.
- Timely preparation and implementation of Resettlement Action Plans (RAPs) and monitoring of livelihood restoration outcomes.

10.4.6 Biodiversity Conservation:

- Area of critical habitats protected or restored and compliance with biodiversity management plans related to riverine and urban green infrastructure.

10.4.7 Indigenous Peoples:

- Number of Indigenous Peoples Plans (IPPs) prepared and implemented,
- Participation of indigenous groups in project consultations and benefit-sharing mechanisms.

10.4.8 Cultural Heritage:

- Implementation of chance-find procedures and management of any discovered cultural heritage sites during infrastructure works.

10.4.9 Stakeholder Engagement and Grievance Redressal:

- Number of stakeholder consultations and public disclosures conducted in local languages.
- Accessibility and effectiveness of project grievance redress mechanisms, including number of cases resolved and feedback incorporated into project adjustments.
- Regular and transparent reporting and disclosure of monitoring results to stakeholders and the World Bank.

These indicators will be tracked through quarterly and annual reports, incident notifications, and third-party audits, with responsibilities shared among the PMU (MITRA), PIUs, and technical consultants to ensure systematic compliance and adaptive management throughout MRDP implementation1.

10.5 Reporting:

The project generates several types of reports to address diverse information needs:

- **Monthly Progress Reports:** Prepared by each PIU, documenting routine monitoring activities, compliance status, emerging issues, and corrective actions. These reports provide regular updates on safeguards implementation at the subproject level.
- **Quarterly Safeguards Reports:** Consolidated by the ESMU at PMU level, synthesizing information from all PIUs and presenting comprehensive analysis of safeguards performance across the project. These reports include quantitative indicators, qualitative assessments, and progress against annual targets.
- **Semi-Annual Monitoring Reports:** Comprehensive documents submitted to the World Bank, providing detailed assessment of ESMF implementation, including compliance status, impacts observed, effectiveness of mitigation measures, stakeholder engagement activities, and grievance resolution.
- **Annual Environmental and Social Audit Reports:** Prepared by independent third-party auditors, evaluating overall compliance with the ESMF and effectiveness of environmental and social management systems. These reports offer impartial assessment and recommendations for improvement.
- **Incident Reports:** Immediate notifications of significant accidents, conflicts, or unforeseen impacts, describing the event, immediate response measures, root cause analysis, and corrective actions. The PMU promptly notifies the World Bank of any serious incidents related to the project.

The reporting system follows a structured flow that ensures efficient information management:

1. Field level monitoring data is collected by site supervisors and submitted to the respective PIU's ES experts. The ES experts compile and validate this information, preparing monthly reports for submission to the PIU head and the PMU's ESMU.
2. The ESMU consolidates reports from all PIUs, conducts quality checks, analyzes trends, and prepares quarterly and semi-annual reports for submission to the Project Director and the World

Bank. This consolidation ensures comprehensive coverage of all project activities while maintaining consistent reporting standards.

3. Specialized reports such as third-party audits follow separate submission channels, with findings communicated directly to the Project Director and subsequently shared with relevant stakeholders. This arrangement ensures independence and objectivity in specialized assessments.
4. Digital platforms facilitate efficient information sharing, with a Project Management Information System (PMIS) serving as a central repository for all monitoring and reporting documents. This system enables real-time access to information, streamlining coordination among implementing agencies.

10.6 Disclosure and Stakeholder Feedback

Monitoring and audit reports are disclosed through multiple channels to ensure transparency and facilitate stakeholder feedback:

- The project website (maintained by MITRA) serves as the primary platform for disclosure of safeguards documents, including monitoring reports, audit findings, and corrective action plans.
- Hard copies of relevant reports are made available at PIU offices, local government institutions, and other accessible locations within the project area, ensuring access for stakeholders without internet connectivity.
- Summary versions of reports are prepared in local languages (Marathi) and shared during community consultations, enabling affected communities to understand monitoring findings and provide feedback.
- Stakeholder feedback on monitoring reports is systematically documented and addressed, with significant concerns incorporated into subsequent monitoring activities. This feedback loop ensures that monitoring remains responsive to stakeholder priorities and concerns.

10.7 Responsibility of reviewing monitoring results

The responsibilities for reviewing monitoring results, assigning corrective actions, and following up on their implementation are distributed among several key stakeholders. This collaborative structure ensures that monitoring, corrective actions, and follow-ups are handled efficiently across technical, environmental, and administrative domains. The responsibilities of monitoring results is mentioned in the table below:

Table 46:Responsibilities of monitoring results

Activity	Responsible Entity	Description
Review of Monitoring Results	Environmental and Social Safeguards Specialists of PMTC	Analyze monitoring data and reports to assess compliance and performance.
Assignment of Corrective Actions	Project Implementation Unit (PIU) / Project Management Unit (PMU)	Decide on necessary corrective measures based on safeguard specialists' input.
Follow-up on Implementation	Field-level Monitoring Teams / PIU with assistance of E&S experts and PMTC	Ensure corrective actions are implemented, documented, and verified. They are also responsible for submitting

Activity	Responsible Entity	Description
		audited reports and implementing local corrective actions.
Oversight and Reporting	Independent Third-Party Auditors / World Bank	Periodic review of monitoring and corrective action effectiveness.
Stakeholder Feedback Integration	Grievance Redress Committee / SEP Team	Incorporate community feedback into monitoring and corrective processes.

11 CAPACITY BUILDING AND TRAINING

The project will implement a multi-layered capacity building program tailored to different stakeholder groups:

11.1 Basic ESMF Orientation

Introductory training for all project staff on ESMF provisions, World Bank ESF requirements, national regulations, and basic environmental and social risk management concepts. This will establish a common understanding of safeguards principles across all implementing agencies.

Technical Training: Advanced training for environmental and social specialists on:

- Environmental and social screening methodologies;
- Impact assessment techniques;
- Preparation and implementation of management plans;
- Stakeholder engagement and consultation approaches;
- Gender mainstreaming and social inclusion;
- Indigenous peoples' development;
- Land acquisition and resettlement planning;
- Occupational health and safety management;
- Environmental monitoring and reporting.

11.2 Role-specific Training

Targeted training for specific roles including:

- Training for contractors on environmental, social, health, and safety requirements
- Training for community facilitators on participatory approaches and grievance handling
- Training for procurement specialists on incorporating environmental and social requirements in bidding documents
- Training for monitoring officers on data collection, analysis, and reporting

11.3 Training Methodologies and Approaches

The capacity building program will employ diverse methodologies to ensure effective learning:

1. Formal Training Workshops: Structured training sessions with expert facilitators, covering theoretical concepts and practical applications;
2. On-the-job Training: Hands-on guidance during actual implementation of environmental and social management activities;
3. Exposure Visits: Field visits to successful projects (including Assam AIRBMP and Andhra Pradesh Disaster Recovery Project sites) to observe good practices in environmental and social management;
4. Peer Learning Exchanges: Regular forums for sharing experiences and solutions among environmental and social practitioners across different implementing agencies;
5. Digital Learning: E-learning modules, webinars, and online resources to provide continuous learning opportunities.

11.4 Technical Assistance

Technical assistance will be provided to support high-quality implementation of the ESMF through specialized expertise, advisory services, and knowledge partnerships. The technical assistance will focus on critical areas that require specialized expertise:

1. **Environmental Management:**
   - Assessment and management of flood and landslide impacts;
   - Water quality monitoring and management;
   - Biodiversity conservation and natural habitat protection;
   - Green infrastructure design and implementation;
   - Environmental monitoring systems and technologies.
2. **Social Development:**
   - Social impact assessment and mitigation;
   - Gender mainstreaming and social inclusion;
   - Stakeholder engagement and community participation;
   - Land acquisition and resettlement.
   - Indigenous people's development planning;
   - Cultural heritage protection;
   - Labor management and community health and safety.
3. **Integrated Risk Management:**
   - Climate risk assessment and adaptation;
   - Disaster risk assessment and management;
   - Environmentally and socially responsive emergency response.
4. **Systems Development:**
   - Environmental and social information management systems;
   - Monitoring and evaluation frameworks;
   - Grievance redress mechanisms;
   - Reporting and disclosure systems.

Technical assistance will be delivered through various modalities to ensure flexibility and responsiveness to emerging needs:

1. **Long-term Specialists:** Environmental and social specialists embedded within the PMU and PIUs to provide continuous technical support.
2. **Short-term Consultancies**: Targeted assignments by specialized experts to address specific technical challenges or develop specialized tools and methodologies.
3. **Institutional Partnerships:** Collaborations with academic and research institutions, technical agencies, and centers of excellence for sustained technical support.
4. **World Bank Technical Support Missions:** Periodic missions by specialists to assess implementation progress, provide hands-on guidance, and recommend improvements.

11.5 Budget and Resources for Institutional Strengthening

Adequate financial resources will be allocated to ensure effective implementation of the institutional arrangements, capacity building, and technical assistance activities for ESMF.

1. **Personnel Costs:** Salaries and allowances for environmental and social specialists at PMU and PIU levels, including dedicated monitoring officers, community facilitators, and technical experts.
2. **Capacity Building:** Resources for training programs, workshops, exposure visits, knowledge exchange activities, and learning materials.
3. **Technical Assistance:** Funding specialized consultants, institutional partnerships, technical support missions, and technology transfer.
4. **Monitoring and Evaluation:** Resources for process monitoring, performance assessments, reviews, and evaluations of institutional arrangements.
5. **Knowledge Management:** Support for development of knowledge products, documentation of lessons learned, and maintenance of resource repositories.

The budget for institutional arrangements, capacity building, and technical assistance will represent approximately 5-7% of the total ESMF implementation budget, aligned with international good practice for complex infrastructure projects with substantial environmental and social dimensions.

Table 47: Proposed Training and Capacity Building Approach

Level	Responsible Party	Audience	Topics / Themes that May Be Covered
State Level	World Bank, PMU	PMU staff responsible for overall ESMF implementation	• Identification and assessment of E&S risks; • Selection and application of relevant E&S; • Risk management measures/instruments; • E&S monitoring and reporting; • Incident and accident reporting; • Application of SEP and the grievance/ beneficiary feedback mechanism.
PIU Level	PMU staff	PIU staff, Contractors	• Identification and assessment of E&S risks; • Selection and application of E&S risk management measures; • E&S monitoring and reporting; • Incident and accident reporting; • Application of SEP and the grievance/ beneficiary feedback mechanism.
Local/Site Level	PIU staff	Staff at project sites, Workers of contractors/subcontractors	• Application of SEP and the grievance/ beneficiary feedback mechanism; • Implementation of Environmental and Social Codes of Practice (ESCOPs) or Environmental and Social Management Plans (ESMPs) as relevant.

Level	Responsible Party	Audience	Topics / Themes that May Be Covered
Community Level	Site-level staff, Contractors	Community members	• Basic Occupational Health & Safety (OHS) measures and use of Personal Protective Equipment (PPE); • Community health and safety issues; • Worker Code of Conduct; • Grievance redress mechanisms for workers and communities.

12 ESMF BUDGET

The State of Maharashtra ensures that, the project will be implemented in accordance with the Environmental and Social Standards (ESSs) and Environmental and Social Commitment Plan (ESCP). State of Maharashtra will implement material measures and actions, as set out in ESCP, such as, institutional, staffing, capacity building, monitoring and grievance management.

As provided in the ESCP, Government of Maharashtra will establish and maintain, throughout the project period, Environmental and Social (E&S) Cell at PMU level, with qualified and experienced staff to support management of Environmental, Social, Health and Safety (ESHS) risks and impacts of the project. Also, one Environmental specialist and one Social development specialist, with requisite qualification and experience, at each of the 5 PIUs.

In this chapter, various activities and measures required to be implemented are identified and necessary budget provision are made .

Following broad sub-head are considered for budgeting.

a) Salaries
b) Capacity building and awareness drive
c) Public consultation
d) NGO for implementation of RAP
e) Third party audits

The concurrent provisions made for Project Management and Technical Consultancy (PMTC) and ESMP implementation are also considered.

Sub-project specific ESMP will be integrated with the bid/construction contracts . It will be the primary responsibility of the contractor to implement the ESMP. PIU will monitor the implementation of the ESMP by the contractor. Penal actions as provided in the contract will be taken on failure to implement provisions in the ESMP. The contractor will be asked to quote its rates considering the cost of implementation of ESMP. However, the costs to be incurred on implementation of ESMP will be considered in the cost estimates. The contractor will ensure effective implementation of EMP during mobilization, construction and demobilization phases. As such no separate budget is provided for the implementation of ESMP.

Similarly, for the sub-projects requiring land acquisition and rehabilitation, RAPs will be prepared and adequate provisions for the implementation of the RAPs will be made in the sub-project estimate.

Currently, DPRs have been prepared for Sangli-Miraj-Kupwad and Kolhapur and Ichalkaranji Storm Water Drainage systems. Current budgetary provision are of **Rs. 425.143 million (1.33% of the total MRDP cost of INR 32,000 Million). However, the State is committed to allocate adequate budget for E&S measures.**

During the implementation, this budget will be reviewed and revised as per the necessity.

Sub-head wise split up of the budget is as under:

Table 48 Sub-head wise budget

SUB-HEAD	Provision in Million (Rs)
Salaries	328.34
Capacity Building including awareness drive	36.64
Public Consultation	4.20
RAP implementation agencies (NGO)	15.00
Audits	14.00
Miscellaneous Provisions	19.16
Total	**417.34**

Table 49: Detailed ESMF budget

Item	Nos.	Duration in years	Salary per month	Estimated Cost	Remarks
A-PMU Level					
Senior Environmental Safeguard Specialist	1	5	350,000	21,000,000	
Senior Occupational, Health and Safety Specialist	1	5	250,000	15,000,000	
Senior Social Development Specialist	1	5	350,000	21,000,000	
Senior Biodiversity Expert / Advisor	1	5	300,000	18,000,000	
Senior Community Consultation Specialist	1	3	250,000	9,000,000	
Senior Land Acquisition/ Resettlement Specialist	1	3	250,000	9,000,000	
Nodal Grievance Officer	1	5	200,000	12,000,000	
			Sub-Total (A)	105,000,000	
B-PIU Level					
Environment Specialist	5	3	250,000	45,000,000	1 for each PIU
Social Specialist	5	3	250,000	45,000,000	1 for each PIU
Grievance Officer	5	3	150,000	27,000,000	1 for each PIU
Resettlement Officer	1	3	150,000	5,400,000	1 for MKVDC
Communication Consultation Specialist	4	3	200,000	28,800,000	1 for each PIU except R&R
E&S Field Staff	6	3	150,000	32,400,000	2 for MKVDC + 1 for other 4 PIUs
Third Party Monitoring Agency (TPMA)	Lumpsum		5,000,000	5,000,000	10 lakh per year for 5 years
Capacity Building	50		500,000	25,000,000	2 trainings per year per PIU for 5 years.
Public Consultations	28		150,000	4,200,000	20 for river works (MKVDC) and 2 each for remaining four PIUs

Item	Nos.	Duration in years	Salary per month	Estimated Cost	Remarks
Engaging NGO for RAP implementation	3		5,000,000	15,000,000	
			Sub-Total (B)	232,800,000	
Concurrent Provisions					
C-PMTC for MKVDC-Component 1 works					
Environmental Safeguards Specialist	1	2	496,000	11,904,000	Duration of PMTC is 42 months. The presence of experts will be intermittent as per requirement. TOR covers ESMP, ensuring ESMP in contract, review of C-ESMP and monitoring ESMP compliance.
Social Safeguards Specialist	1	2	325,000	7,800,000	
Community Consultation Specialist	1	1	520,000	6,240,000	
			Sub-Total (C)	25,944,000	
D-ESMP IMPLEMENTATION IN SMKMC					
Social and Gender Expert	1	3	100,000	3,600,000	
Environmental Expert	1	3	100,000	3,600,000	
Capacity Building		Lumpsum		2,280,000	
E&S Audit		Lumpsum		3,000,000	
Awareness Drive		Lumpsum		1,600,000	
			Sub-Total (D)	14,080,000	
E-ESMP IMPLEMENTATION IN KMC					
Social and Gender Expert	1	3	100,000	3,600,000	
Environmental Expert	1	3	100,000	3,600,000	
Capacity Building		Lumpsum		2,280,000	
E&S Audit		Lumpsum		3,000,000	
Awareness Drive		Lumpsum		1,600,000	
			Sub-Total (E)	14,080,000	
F-ESMP IMPLEMENTATION IN IMC					
Social and Gender Expert	1	3	100,000	3,600,000	
Environmental Expert	1	3	100,000	3,600,000	
Capacity Building		Lumpsum		2,280,000	
E&S Audit		Lumpsum		3,000,000	
Awareness Drive		Lumpsum		1,600,000	

Item	Nos.	Duration in years	Salary per month	Estimated Cost	Remarks
			Sub-Total (F)	14,080,000	
G-MISCELLANEOUS E&S PROVISIONS				19,159,200	5 % of itemised provisions
			GRAND TOTAL (A to G)	**425,143,200**	
ACTIVITY-WISE BREAKUP OF THE BUDGET					
Salaries				336,144,000	
Capacity Building including awareness drive				36,640,000	
Public Consultation				4,200,000	
RAP implementation agencies (NGO)				15,000,000	
Audits				14,000,000	
Miscellaneous Provisions				19,159,200	
			Total	**425,143,200**	
Note- PPE cost will be included in the works contracts					

ANNEXURE 1: ENVIRONMENT SCREENIG CHECKLIST

(Read with section 4)

(This Screening sheet must be completed for each of the proposed sub-project and forwarded to the Environment Specialist in PMU along with the following enclosures.**)**

1. Identification (Sub Project location/s):

Sr. No.	Particulars	Details
1.	Date of Screening	
2.	Package No./Package ID	
3.	Location	
4.	Sub Project Name	
5.	Sub Project Type	
6.	GPS Coordinates Starting	
7.	Sub Project Details in brief	

2. General Information

Sr. No.	Components	Details
1.	Details of each Activities proposed (main components including construction activities)	
2.	Location of the sub project Site & Site Survey Nos. (with ownership)	
3.	Current Land use (Provide information for the sites involved in the project), any historical use (related to heritage, or contamination)	
4.	Reason for selecting the proposed site	
5.	Alternative Sites considered	
6.	Details of alternative sites during site visit	
7.	Connectivity (By road/rail/waterways)	
8.	Approach Road	
9.	Dredging (of water bodies) Activities	

3. Proposed Resource Use (ESS3)

Resource Use				
Sr. No	**Proposed Resources**	**Area/ Quantity**	**Unit**	**Details**
1	Land Area proposed to be used: Location wise (in acre/sq.km/sq.m) a. Actual construction			
2	Temporary use for camp area, storage, haul road, etc.			

	Resource Use			
Sr. No	**Proposed Resources**	**Area/ Quantity**	**Unit**	**Details**
1	Land Area proposed to be used: Location wise (in acre/sq.km/sq.m) a. Actual construction			
	Temporary use for camp area, storage, haul road, etc.			

4. Baseline Environmental Conditions (ESS1)

Sr. No	**Environmental Aspects**	**Yes**	**No**	**Details**
1.	Is the project site located on or adjacent to any of the following (Provide information for all sites and alignment of the project components/subcomponents, associated activities)			
i)	Habitat Types- Modified, natural or Critical Habitat			
ii)	Critically Vulnerable, Eco-sensitive Areas			
iii)	Cultural Heritage site, Protected monuments			
iv)	Natural Forests/Protected Areas Is the sub project in an eco- sensitive or adjoining an eco-sensitive area? If Yes, provide details.			
v)	Notified Wetlands			

Sr. No	Environmental Aspects	Yes	No	Details
vi)	Any Natural Habitat areas, areas with natural features? (Wildlife Sanctuaries, National Parks, Reserved Forests)			
vii)	Any other Sensitive Environmental Components?			
viii)	Any Residences schools, hospitals, sensitive receptors?			
ix)	Any culturally–socially important paths, areas/religious occupancies, burial grounds, tourist or pilgrim congregation areas, borders, etc.?			
x)	Any drinking water source, upstream and downstream uses of rivers, etc.?			
xii)	Any areas affected by other disasters?			
2.	Is the site in Critical/Over Exploited condition?			
3.	Is the area disaster-prone? If yes; list all disaster zone categories applicable			
4.	Describe the soil and vegetation on site			
5.	Is the site area and condition suitable for proposed development?			
6.	Describe existing pollution or degradation in the site(s)			
9.	Does the Area have any component leading to climate change?			
10.	Any other remarks on baseline condition?			

5. Anticipated Environmental Impacts: Impacts on Land, Geology and Soils (ESS1)

Sr. No	Impacts	Yes/ May create	No	Details
1.	Will the proposed project cause the following on Land/Soil:			
i)	Impact on Surrounding Environmental Conditions including Occupation on Low lying lands/floodplains			
ii)	Substantial removal of Topsoil (mention area in ha)			
iii)	Any degradation of land/eco-systems expected due to the project?			

Sr. No	Impacts	Yes/ May create	No	Details
iv)	Loss or impacts on Cultural/heritage properties (ESS8)			
v)	Does the project activity involve cutting and filling/blasting etc.?			
vi)	Will the project cause physical changes in the project area (e.g., changes to the topography) due to earth filling, excavation, earth work or any other activity?			
vii)	Will the project involve any quarrying?			
viii)	Does the project involve any land reclamation? If yes, please provide the following details. ✓ Activity for which land to be reclaimed Area of land to be reclaimed(Hectares)			
ix)	Will the project/ any of its components contaminate or pollute the Land?			
x)	Will the project contribute to any long-term significant adverse (negative), large scale, irreversible, sensitive impact at a regional scale or area broader than the project sites?			

6. Impacts on Labour and Working Conditions (ESS2)

Sr. No	Impacts	Yes/ May create	No	Details
1.	Will the proposed project cause the following on Labor and Working Conditions:			
i)	Would elements of project construction, operation, or decommissioning pose potential safety risks to local communities?		No	
ii)	Does the project involve large-scale infrastructure development (e.g. dams, roads, buildings)?		No	
iii)	Does the project pose high risk to the workers/labourers?		No	
iv)	Will the project pollute the workplace environment?		No	

7. Impacts on Water Environment (ESS3)

Sr. No	Impacts	Yes/May Create	No	Details
1.	Will the subproject or its components cause any of the following impact on Water sources (Quantity or Quality):			
i)	Will the activities propose at the site(s) impact water quality (surface or underground) and water resource availability and use? Will this sub-project involve the dredging of water bodies, canals, etc.			
ii)	Impacts on Water Resources			
iii)	Pollution of Water bodies/ground water nearby or downstream			
iv)	Will the project affect the river/canal flow pattern, stream pattern or any other irrigation canal?			
v)	Will the project result in stagnation of water flow or pondage or weed growth			
vi)	In case the approach road passes through a flood plain of a river following details are required: Detailed micro-drainage Flood passages Flood periodicity in the area			

8. Impacts on Biodiversity and Host Communities (ESS6).

Sr. No	Environmental Impacts	Yes/May Create	No	Details
1	Will the subproject or its components cause any of the following impacts on Biodiversity or on the neighbourhood?			
i)	Does the site preparation require cutting of trees? If yes, please furnish the following details: How many trees are to be cut? Species of the above trees			
ii)	Are there any protected/ endangered species? If yes, provide details.			
iii)	Potential risk of habitat fragmentation due to the clearing activities? (e.g., Hindrance to the local biodiversity like disturbing the migratory path of animals/ birds, etc.)			

Sr. No	Environmental Impacts	Yes/May Create	No	Details
vi)	Does the proposed project site involve any breeding or nesting ground? If yes, provide the following details. -Name of the Aquatic Organism -Type of Habitat -Period of the year in which the activity take place			

The screening of the ecological sensitivity areas considering 15 kms of the ariel distance from the intervention area in accordance to the baseline data is given in Table below.

Sr. No.	Ecological Significant Feature		Availability within Sub-project Area (15 Km ariel distance)
1.	Elephant corridors		
2.	Wildlife corridors		
3.	Meandering rivers		
4.	Flood-prone areas		
5.	Areas of severe landslides		
6.	River erosion		
7.	Flood embankment		
8.	Eco-sensitive areas/stretches in rivers (including habitats of endangered or vulnerable species)		
9.	Physical cultural properties		
10.	Protected Areas	National Parks	
		Reserved Forest	
		RAMSAR sites	
		Biosphere reserves	
11.	Unprotected and community forests		
12.	Forest patches		
13.	Protected Wetlands		
14.	Surface water bodies		

9. **Impacts due to Storage and Wastes: Pollution and Hazards (ESS3 and ESS4)**

	Type	Yes	No	Details
1	Will the subproject or its components cause any impact due to storage of materials, wastes or pollution due to releases during various project activities			
i)	Will the project use or store dangerous substances (e.g., large quantities of hazardous chemicals/materials like Chlorine, Diesel, Petroleum products; any other?)			
ii)	Will the project produce solid or liquid wastes; including construction/demolition wastes (including dredging, de-weeding wastes, muck/silt, dust);polluted liquids?			
iii)	Will the project cause or increase air pollution or odour nuisance?			
iv)	Will the project generate or increase noise levels which will impact surrounding biodiversity or communities?			
v)	Will the project generate or increase visual light or light pollution?			
vi)	Will the project cause water pollution? (of waterbodies/groundwater)?			
vii)	Will the project involve dangerous construction activities which may be a safety concern to workers/ host communities			
viii	Is there a potential for release of toxic gases or accident risks (e.g., potential fire outbreaks)			
2	Describe any other features of the project that could influence the ambient environment			
3	Were the probable environmental impacts discussed with stakeholders?			

Project Risk Categorization and Need for Safeguards Instruments, Oversight

	□ Low □ Moderate □ Substantial □ High
Key Reasons	
Safeguards Instruments Required	

Status	**Agency / Official**	**Name, Signature with Date and Seal**
Prepared by		

Checked and categorized as (low, moderate, substantial, high) by:	Environmental Specialist	
	PMU	
Reviewed & accepted by:	Executive Officer (Non-Technical)	
	PMU	

ANNEXURE 2: SOCIAL SCREENIG CHECKLIST

(Read with section 4)

(This Screening must be done for each subproject by Social Experts)

Sr. No	Components	Yes	No	Details
1.	Is the project location in scheduled area			
2.	Is the project location comprising scheduled tribes?			
3.	Does the project involve the acquisition of private land?			
4.	Does this private land belong to tribal (individual or group)			
5.	Will there be alienation of any type of Government land?			
6.	Clearance of encroachment from Government/community-owned Land?			
7.	What is the current land use of these identified land parcels/area			
8.	What are the existing land uses around the project area (e.g., community facilities, agriculture, tourism, private property) affected?			
9.	Clearance of squatters/encroachers from Government/community owned Land?			
10.	Land requirement for the sub-project (in ha)			
10.1	Private			
10.2	Government			
10.3	Community/village			
10.4	Forest			
10.5	Others any			
11.	Number of structures, both authorized and/or unauthorized to be acquired/cleared?			
11.1	Total Affected			
11.2	Title Holders			
11.3	Non-titleholders (Encroacher)			
11.4	Non-titleholders (Squatter)			
11.5	People losing livelihoods/access due to loss of Govt. Lands to Project			
12.	Will the project result in the permanent or temporary loss of the following?			
12.1	Crops?			
12.2	Fruit trees? Specify with types (for screening type is enough)			
12.3	Petty Shops			
12.4	Vegetable/Fish/Meat vending			

Sr. No	Components	Yes	No	Details
12.5	Cycle repair shop			
12.6	Garage			
12.7	Tea stalls			
12.8	Grazing land			
12.9	Loss of access to forest produce (NTFP)			
12.10	Any others –specify			
13.	Nature of structures that require to be removed			
13.1	Pucca			
13.2	Semi-pucca			
13.3	Kutcha			
14.	Estimated number of households to be displaced?			
15.	Will the proposed sub-Project activity result in loss of direct livelihood/ employment? To fishermen or boat operators etc.			
16.	Will the proposed Project activity result in loss of crops/trees which is not Government property?			
17.	Does the proposed activity result in loss of social Forest on which nearby residents/local population are dependent for fuel wood/grazing etc.?			
18.	Village common properties to be alienated Pastureland (acres) Acquisition / burial ground and others specify? (Type and quantity)			
18.1	Pastureland(acres)			
18.2	Burial ground			
18.3	Temple land			
18.4	School/Anganwadi land			
18.5	Any Other(specify)			
19.	Historical heritage site(s) require excavation near the project site?			
20.	Archaeological heritage site(s) require excavation near the project site?			
21.	Cultural heritage site(s) require excavation near the project site?			
22.	Graves or sacred locations require excavations near the project site?			
23.	Is the project likely to impose any restriction of access to resources (e.g., temporary or permanent restriction of access to public water source, access to school)			

Sr. No	Components	Yes	No	Details
24.	Does the sub-project have any existing tribal grievance mechanism that is functioning?			
25.	Are there disputes relating to land or other ownership, etc. or legacy issues (e.g., wasteland Claimed as government land)			
26.	Is there any other conflict in the area or risk (between different groups)			
27.	Are there any disadvantaged groups or individuals (disabled persons or communities having lands eroded every year and being forced to migrate). If so, list them			
28.	Is the project location near school or other medical facilities			
29.	Will the activity engage in gender-based violence (GBV) ?			
30.	Is there any perceived threat or danger or risk of SEA/SH to female (children, ladies) due to in-migration of workers. If so, which are these hot spots			
31.	Will the project result in construction workers or other people moving into or having access to the area (for a long time period and in large numbers compared to permanent residents)?			
32.	Is the project likely to provide local employment opportunities, including employment opportunities for women?			
33.	Is the project being planned with sufficient attention to local poverty alleviation objectives?			
34.	Is the project being designed with sufficient local participation (including the participation of women) in the planning, design, and implementation process?			
35.	What types of workers are expected to be involved – unskilled, skilled, semi-skilled. In total how many workers?			
36.	Will there be community workers who provide community labor for the subproject with or without payment?			
37.	Are financial compensation measures expected to be needed?			
38.	What are the existing government programs in the area towards flood relief? What does relief measures Contain in terms of			

Sr. No	Components	Yes	No	Details
	factions, materials (food packets, mosquito nets).			
39.	Are there are any SHGs operational in the area			
40.	If so, what area of activities that SHGs involve in			
41.	Are there are any NGOs operational in the area			
42.	If so, what area of activities that NGOs involve in			
43.	Does the project area already have community volunteers/boat operators who have Contributed to relief operations			

	□ Low □ Moderate □ Substantial □ High
Key Reasons	
Safeguards Instruments Required	

Status	**Agency / Official**	**Name, Signature with Date and Seal**
Prepared by		

Checked and categorized as (low, moderate, substantial, high) by:	Environmental Specialist	
	PMU	
Reviewed & accepted by:	Executive Officer (Non-Technical)	
	PMU	

ANNEXURE 3: E&S RISK CATEGORIZATION TEMPLATE FOR CIVIL WORKS OF RAHDANAGRI DAM, RIVER TRAINING WORKS, WATER STORAGE STRUCTURES & LANDSLIDE MITIGATION WORKS

(Read with section 4.2.2)

1. **Name of Sub-Project:**
2. **Rating Scale:** No impact / positive impact : 0, Low:1, Moderate:2, Substaintial:3, High: 4
3. **Table E1: Environmental Screening Matrix** **Maximum Score : 36**

Code	Screening Parameter	Assessment Impact	Justification in Support of Assessment	Assigned Score
E1	Location sensitivity Proximity to eco-sensitive areas (PA, ESZ, wetlands, forests) (ESS 6)			
E2	Scale and footprint of civil works (ESS 1)			
E3	Construction-related pollution emissions (Air, Water) (ESS 3)			
E4	Biodiversity & habitat sensitivity			
E5	resource depletion			
E6	Construction waste generation (ESS 3)			
E7	Change in river/drain morphology (ESS 6)			
E8	Cumulative Impact			
E9	Impact on Climate & disaster risk (ESS 1)			
	Total Environmental Score			

4. **Table S1: Social Screening Matrix** **Maximum Social Score: 48**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
S1	Land acquisition (ESS 5)			
S2	Physical Displacement (ESS 5)			
S3	Loss of livelihood (ESS 5)			
S4	Impact on vulnerable groups (ESS 5)			
S5	OHS risks to project workers (ESS 2)			
S6	Impact on indigenous Peoples (ESS7)			

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
S7	Risk due to Labor influx (ESS 2)			
S8	Risks to Community health & safety (ESS 4) Nearness of work to habitat			
S9	Risk to Dam Safety (ESS 4)			
S10	Impact on cultural heritage (ESS 8)			
S11	Stakeholder Opposition (ESS 10)			
S12	SEA/SH risk (ESS 2)			
	Total Social Score			

5. **Table I1: Institutional / Governance Risks Screening Maximum Score: 16**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
I1	Implementing agency E&S handling capacity			
I2	Past E&S compliance			
I3	GRM availability			
I4	Regulatory compliance			
	Total Institutional Screening Score			

6. **Total Maximum Possible Score = 100 Total Assigned Score:**

7. **Risk Categorization Thresholds**

0 – 25	**Low Risk**
26 – 50	**Moderate Risk**
51 – 75	**Substantial Risk**
> 76	**High Risk**

8. **Identified risk:**

9. **Narrative / Qualitative Justification :**

10. **ESS Applicability Mapping (for ESMF)**

ESS	Applicability
ESS1	All subprojects
ESS2	All civil works
ESS3	Construction-related impacts
ESS4	Community health & safety
ESS5	Land acquisition / livelihood impacts
ESS6	Biodiversity & natural habitats
ESS7	Indigenous Peoples (if present)
ESS8	Cultural heritage

ESS9	Financial Intermediaries
ESS10	Stakeholder engagement & GRM

11. Safeguard Instruments Based on ESS Triggers & Risk Category

Risk Category	Instruments Required
Low	ESMP Checklist, SEP
Moderate	ESMP, SEP, LMP
Substantial	ESIA, ESMP, Other sub-project specific instruments as per applicability such as RAP/ARAP, SEA/SH Action Plan, SEP, LMP
High	Full ESIA + multiple plans (case-specific)

ANNEXURE 3.1: E&S RISK CATEGORIZATION TEMPLATE FOR CIVIL WORKS OF RAHDHANAGARI DAM

(Read with section 4 & 5.3)

1. **Name of Sub-Project:** Civil works of Radhanagari dam
2. **Rating Scale:** No impact / positive impact:0, Low:1, Moderate:2, Substaintial:3, High: 4
3. **Table E1: Environmental Screening Matrix** **Maximum Score: 36**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
E1	Location sensitivity (PA, ESZ, wetlands, forests) (ESS 6)	High	The work site is adjacent to Radhanagari WLS	4
E2	Scale and footprint of civil works (ESS 1)	Substantial	Cost of work is INR785 Million 9 US & 9.81 Million); Excavation 2,59,198 cubic meter Concrete: 6, 000 cubic meter Steel Reinforcement : 72 MT Structural steel : 122 MT	3
E3	Construction-related pollution emissions (Air, Water) (ESS 3)	Substantial	Air pollution due to emission of construction vehicles & construction activities, also water pollution due to wastewater and oil spills, in river	3
E4	Biodiversity & habitat sensitivity	Substantial	Tree cutting of 80 trees proposed. Vibrations and sound generated during construction may impact birds and animals. No impact on corridors of the wildlife.	3
E5	Resource depletion	Substantial	Sand, cement steel, stone, water, and energy consumption during construction. Minimal energy requirement for gate operation during lifecycle.	3
E6	Construction waste generation (ESS 3)	Substantial	Excavation debris are of the order of 2,59,198 cum. But there are old mines near worksite in which debris can be safely and systematically disposed	3
E7	Alteration in river/drain morphology & flow (ESS 6)	Low	No change in river morphology anticipated. Proposed work is on existing dam line. Disposal of debris in existing mines.	1
E8	Cumulative / future Impact	Low	There is no cumulative impact but low future impact due to maintenance activities like oiling greasing to gates.	1
E9	Impact on Climate & disaster risk (ESS 1)	No impact	Sub-project will increase safety of dam and moderate the flood risks of downstream population.	0
	Total Env. Score			**21**

4. **Table S1: Social Screening Matrix** **Maximum Social Score: 48**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
S1	Land acquisition (ESS 5)	No impact	No land acquisition required. The work is proposed in the land of 2.31 Ha, of non-forest land which is in possession of WRD	0
S2	Physical Displacement (ESS 5)	No impact	There is no displacement	0
S3	Loss of livelihood (ESS 5)	No impact	There is no loss of livelihood. During construction phase also water for irrigation, domestic use will be released in river.	0
S4	Impact on vulnerable groups (ESS 5)	No impact	There is no physical or economic displacement. Work in WRD premises only.	0
S5	OHS risks to project workers (ESS 2)	High	Due to risk at higher elevation and in the gate shafts	4
S6	Impact on indigenous Peoples (ESS7)	No Impact	No displacement. No indigenous people in project influence area.	0
S7	Risk due to Labor influx (ESS 2)	Substantial	About 50 labours will be working for 2 years.	3
S8	Risks to Community health & safety (ESS 4) Nearness of work to habitat	Moderate	The worksite isolated from community	2
S9	Risk to Dam Safety (ESS 4)	Substantial	Risk of vibrations due to exaction activities but manageable by avoiding blasting.	3
S10	Impact on cultural heritage (ESS 8)	Substantial	The frequency of operation of automatic gates constructed by Rajashri Shahu Maharaja of Karvir will reduce.	3
S11	Stakeholder Opposition (ESS 10)	Substantial	Stakeholder insist for preservation of automatic gates. Sentiments are respected by engineering change. Additional spillway provided in adjacent location instead of replacement. Of automatic gates.	3
S12	SEA/SH risk (ESS 2)	Substantial	Workers camps will be there for 2 years.	3
	Total Social Score			**21**

5. Table I1: Institutional / Governance Risks Screening — Maximum Score: 16

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
I1	Implementing agency E&S handling capacity	Moderate	E&S staffing & capacity building arrangements made	2
I2	Past E&S compliance	Moderate	Mixed experience	2
I3	GRM availability	Moderate	Partial availability	2

I4	Regulatory compliance	Substantial	Prior clearance of National Board of Wildlife required.	3
	Total Institutional Screening Score			**9**

6. **Total Maximum Possible Score = 100** **Total Assigned Score: 51**

7. **Risk Categorization Thresholds**

0 – 25	Low Risk
26 – 50	Moderate Risk
51 – 75	**Substantial Risk**
> 76	High Risk

8. **Identified risk: Substantial**

9. **Narrative / Qualitative Justification:** Although the worksite is adjacent to Radhanagari WLS, WLS and worksite are totally isolated by the waterbody. There is no land acquisition, no diversion of forest land, no displacement. Also, there is no increase in water level or submergence. The work area is well separated from community. **The sub-project will not have any unprecedented or irreversible impacts. Risks are manageable with ESMP based on detailed assessment.**

10. **ESS Applicability Mapping (for ESMF)**

ESS	Applicability
ESS1	**Yes**
ESS2	**Yes**
ESS3	**Yes**
ESS4	**Yes**
ESS5	**No**
ESS6	**Yes**
ESS7	**No**
ESS8	**Yes**
ESS9	**No**
ESS10	**Yes**

11. **Safeguard Instruments Based on Risk Screening, ESS Triggers, & Category**

ESIA, ESMP, SEP, LMP, SEA/SH Action plan, Cultural Heritage Management Plan, Dam instrumentation plan, Construction waste disposal plan.

ANNEXURE 3.2: E&S RISK CATEGORIZATION TEMPLATE FOR CIVIL WORKS OF RIVER TRAINING WORKS

(Read with section 4 & 5.3)

1. **Name of Sub-Project:** Civil works of river training works.
2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4
3. **Table E1: Environmental Screening Matrix** **Maximum Score: 36**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
E1	Location sensitivity (PA, ESZ, wetlands, forests) (ESS 6)	No	No PA / ESZ, Wetland, forest within project influence area. (radius of 10 km)	0
E2	Scale and footprint of civil works (ESS 1)	Substantial	The quantity of dredging, desilting , construction of embankments for levees will be substantial.	3
E3	Construction-related pollution emissions (Air, Water) (ESS 3)	Substantial	Air pollution due to emission of construction vehicles & construction activities, also water pollution due to washout of waste in river and turbidity of river water may increase.	3
E4	Biodiversity & habitat sensitivity	Substantial	Increase in turbidity of river water may impact aquatic life.	3
E5	Resource depletion	Substantial	Sand, cement , steel, stone, water & fuel consumption	3
E6	Construction waste generation (ESS 3)	Substantial	Silt will be removed from the river.	3
E7	Alteration in river/drain morphology & flow (ESS 6)	Substantial	During river training silt removal, widening, rejuvenation of paleo channels, removal of obstruction is likely to affect river morphology	3
E8	Cumulative / future Impact	Substantial	Cumulative impact is expected due to multiple works in same river.	3
E9	Impact on Climate & disaster risk (ESS 1)	No impact	Moderate the flood risks of downstream villages .	0
	Total Environmental Score			**21**

4. **Table S1: Social Screening Matrix** **Maximum Social Score: 48**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
S1	Land acquisition (ESS 5)	Substantial	Most of the work will be confined in river (Government land) but some land will have to be acquired.	3
S2	Physical Displacement (ESS 5)	moderate	Walkthrough and drone survey has indicated that there would not be physical displacement. But there	2

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
			would be some cases of access limitations.	
S3	Loss of livelihood (ESS 5)	Moderate	During construction due to degradation of water quality fishing activities will impact. Also, possibility of loss of livelihood of agricultural labours can't be ignored.	2
S4	Impact on vulnerable groups (ESS 5)	Moderate	Physical displacement negligible.	2
S5	OHS risks to project workers (ESS 2)	Substantial	Risk of working in river flow, working with heavy machinery.	3
S6	Impact on indigenous Peoples (ESS7)	No Impact	No displacement. No indigenous people in project influence area.	0
S7	Risk due to Labor influx (ESS 2)	Substantial	Migrated labours are expected. Estimated labour 300 spread over multiple locations in group of 25. Duration 3 years.	3
S8	Risks to Community health & safety (ESS 4) Nearness of work to habitat	moderate	Work will be away from habitation.	2
S9	Risk to Dam Safety (ESS 4)	No impact		0
S10	Impact on cultural heritage (ESS 8)	Moderate	No identified cultural heritage sites but possibility of impact on religious structures can't be ignored	2
S11	Stakeholder Opposition (ESS 10)	Substantial	Not yet done. But stakeholder will have concerns for such as loss of fertile land and loss of access etc.	3
S12	SEA/SH risk (ESS 2)	Substantial	Workers camps will be there.	3
	Total Social Score			**25**

5. Table I1: Institutional / Governance Risks Screening **Maximum Score: 16**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
I1	Implementing agency E&S handling capacity	moderate	E&S staffing & capacity building arrangements made	2
I2	Past E&S compliance	Moderate	Mixed experience	2
I3	GRM availability	Moderate	Partial availability	2
I4	Regulatory compliance	moderate	Permission / Permits for working will be required	2
	Total Institutional Screening Score			**8**

6. Total Maximum Possible Score = 100 **Total Assigned Score: 54**

7. Risk Categorization Thresholds

0 – 25	Low Risk
26 – 50	Moderate Risk
51 – 75	**Substantial Risk**
> 76	High Risk

8. Identified risk: Substantial

9. Narrative / Qualitative Justification:

River training works vary in nature and associated risks varies accordingly. The most severe, scenario is considered for risk categorization, in which substantial risk of land acquisition, disposal of excavated stuff, river water quality degradation during execution and change in river morphology are expected. **These risks are manageable with ESMP based on detailed assessment.**

Other river training works, such as removal of silt, restoration of natural cross section of river within government land, removal of obstacles to flow, improving hydraulic performance of structures etc. will not require land acquisition related risks.

10. ESS Applicability Mapping (for ESMF)

ESS	Applicability
ESS1	Yes
ESS2	Yes
ESS3	Yes
ESS4	Yes
ESS5	Yes
ESS6	Yes
ESS7	No
ESS8	Yes
ESS9	No
ESS10	Yes

11. Safeguard Instruments Based on ESS Triggers and Risk Screening & Category

ESIA, ESMP, SEP, LMP, SEA/SH Action plan, Cultural Heritage Management Plan, Silt and excavated stuff disposal plan, Sediment Management Plan.

ANNEXURE 3.3: E&S RISK CATEGORIZATION TEMPLATE FOR CIVIL WORKS OF CONSTRUCTION OF NEW WATER STORAGE STRUCTURES AND MAINTENANCE OF EXISTING WATER STORAGE STRUCTURES IN FREE CATCHMENT

(Read with section 4 & 5.3)

1. **Name of Sub-Project:** Civil works of construction of new water storage structures and maintenance of existing water storage structures in free catchment.
2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4
3. **Table E1: Environmental Screening Matrix** **Maximum Score: 36**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
E1	Location sensitivity (ESS 6)	No	No PA / ESZ, Wetland, forest within project influence area. (radius of 10 km)	0
E2	Scale and footprint of civil works (ESS 1)	Substantial	New water storage structures will require substantial, excavation, embankment and concrete works.	3
E3	Construction-related pollution emissions (Air, Water) (ESS 3)	moderate	Air pollution due to emission of construction vehicles & construction activities, also water pollution due to washout of waste in river . However, works will be away from habitation.	2
E4	Biodiversity & habitat sensitivity	moderate	Few trees will be cut. Change in existing land use.	2
E5	Resource depletion	Substantial	Sand, cement , steel, stone, water ,& fuel consumption	3
E6	Construction waste generation (ESS 3)	moderate	Some construction waste will be generated from excavation. However, most of the material will be reused.	2
E7	Alteration in river/drain morphology & flow (ESS 6)	Substantial	Moderate changes are expected at the location of structure. Impact on downstream flow conditions.	3
E8	Cumulative / future Impact	Low	There would not be any cumulative adverse impacts.	1
E9	Impact on Climate & disaster risk (ESS 1)	No adverse impact	In fact, subproject moderate the flood risks of downstream villages .	0
	Total Environmental Score			**16**

4. **Table S1: Social Screening Matrix** **Maximum Social Score: 48**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
S1	Land acquisition (ESS 5)	Substantial	Impact will be very limited.	3
S2	Physical Displacement (ESS 5)	moderate	Impact will be very limited.	2
S3	Loss of livelihood (ESS 5)	Moderate	Impact will be very limited.	2

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
S4	Impact on vulnerable groups (ESS 5)	Moderate	Impact will be very limited.	2
S5	OHS risks to project workers (ESS 2)	Substantial	Risk of working with heavy machinery.	3
S6	Impact on indigenous Peoples (ESS7)	No Impact	No displacement. No indigenous people in project influence area.	0
S7	Risk due to Labor influx (ESS 2)	Substantial	Workplaces will be away from habitation.	3
S8	Risks to Community health & safety (ESS 4) Nearness of work to habitat	moderate	Workplaces will be away from habitation.	2
S9	Risk to Dam Safety (ESS 4)	Substantial	Adequate precautions to be taken during construction.	3
S10	Impact on cultural heritage (ESS 8)	Moderate	No identified cultural heritage sites but possibility of impact on religious structures can't be ignored	2
S11	Stakeholder Opposition (ESS 10)	Substantial	Not yet done. But stakeholder will have concerns for loss of land and loss of access etc.	3
S12	SEA/SH risk (ESS 2)	Substantial	Workers camps will be there.	3
	Total Social Score			**28**

5. Table I1: Institutional / Governance Risks Screening Maximum Score: 16

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
I1	Implementing agency E&S handling capacity	moderate	E&S staffing & capacity building arrangements made	2
I2	Past E&S compliance	Moderate	Mixed experience	2
I3	GRM availability	Moderate	Partial availability	2
I4	Regulatory compliance	moderate	Permission / Permits for working will be required	2
	Total Institutional Screening Score			**8**

6. Total Maximum Possible Score = 100 Total Assigned Score: 52

7. Risk Categorization Thresholds

0 – 25	Low Risk
26 – 50	Moderate Risk
51 – 75	**Substantial Risk**
> 76	High Risk

8. Identified risk: Substantial

9. **Narrative / Qualitative Justification:** This Sub-project comprises of mixed nature of works such as catchment area treatment, rejuvenation of existing water bodies and construction of new storage tanks. Construction of new storage tanks have higher risks and hence it is selected for risk category assessment. The works of new storage tanks have land acquisition and related risks, but its extent will be small. **Risks are manageable with ESMP based on detailed assessment.**

   Other two types of works viz. catchment area treatment works and remuneration of existing storage tanks do not require any land acquisition or displacement. Further, the construction period will be very limited (about 1 month). Labour requirement will also be very minimal.

10. **ESS Applicability Mapping (for ESMF)**

ESS	Applicability
ESS1	Yes
ESS2	Yes
ESS3	Yes
ESS4	No
ESS5	Yes
ESS6	Yes
ESS7	No
ESS8	Yes
ESS9	No
ESS10	Yes

11. **Safeguard Instruments Based on ESS Triggers and Risk Screening & Category**

    ESIA, ESMP, SEP, LMP, SEA/SH Action plan, Cultural Heritage Management Plan. (if required)

ANNEXURE 3.4: E&S RISK CATEGORIZATION TEMPLATE FOR CIVIL WORKS OF LANDSLIDE MITIGATION MEASURES

(Read with section 4 & 5.3)

1. **Name of Sub-Project:** Civil works of landslide mitigation measures.
2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4
3. **Table E1: Environmental Screening Matrix** **Maximum Score: 36**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
E1	Location sensitivity (ESS 6)	No	No PA / ESZ, Wetland, forest within project influence area. (radius of 10 km)	0
E2	Scale and footprint of civil works (ESS 1)	Moderate	Works will involve slope stabilization by excavation, rock-bolting & shotcrete, and construction of retaining walls.	2
E3	Construction-related pollution ^ emissions (Air, Water) (ESS 3)	Moderate	Air pollution due to emission of construction vehicles & equipment, & dust.	2
E4	Biodiversity & habitat sensitivity	Moderate	Few trees will be cut.	2
E5	Resource depletion	Moderate	Sand, cement , steel, stone, water ,& fuel consumption	2
E6	Construction waste generation (ESS 3)	Moderate	Some construction waste will be generated from excavation.	2
E7	Alteration in river/drain morphology & flow (ESS 6)	No impact	----	0
E8	Cumulative / future Impact	No impact	There would not be any cumulative adverse impacts.	0
E9	Impact on Climate & disaster risk (ESS 1)	No adverse impact	Works will reduce landslide disasters	0
	Total Environmental Score			**10**

4. **Table S1: Social Screening Matrix** **Maximum Social Score: 48**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
S1	Land acquisition (ESS 5)	No impact		0
S2	Physical Displacement (ESS 5)	No impact		0
S3	Loss of livelihood (ESS 5)	No impact		0
S4	Impact on vulnerable groups (ESS 5)	No impact		0
S5	OHS risks to project workers (ESS 2)	Substantial	Risk of working at higher elevation, Rockfall during work.	3
S6	Impact on indigenous Peoples (ESS7)	No	No displacement. No indigenous people in project influence area.	0

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
S7	Risk due to Labor influx (ESS 2)	Moderate	Limited labours for short duration. (Approximately 25 labour at each location, for two months)	2
S8	Risks to Community health & safety (ESS 4)	Moderate	If the work is in ghat road, it will have to be managed with sign-boards, barricading and traffic management plan. But duration of work will be very limited.	2
S9	Risk to Dam Safety (ESS 4)	No impact		0
S10	Impact on cultural heritage (ESS 8)	No impact		0
S11	Stakeholder Opposition (ESS 10)	Low	Not yet done. But stakeholder will not have any material concerns.	1
S12	SEA/SH risk (ESS 2)	Substantial	Limited Labour for short duration (Approximately 25 labour at each location, for two months) but work at remote places.	3
	Total Social Score			**11**

5. Table I1: Institutional / Governance Risks Screening Maximum Score: 16

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
I1	Implementing agency E&S handling capacity	moderate	E&S staffing & capacity building arrangements made	2
I2	Past E&S compliance	Moderate	Mixed experience	2
I3	GRM availability	Moderate	Partial availability	2
I4	Regulatory compliance	Low	Permission / Permits for working will be required	1
	Total Institutional Screening Score			**7**

6. Total Maximum Possible Score = 100 Total Assigned Score: 28

7. Risk Categorization Thresholds

0 – 25	Low Risk
26 – 50	**Moderate Risk**
51 – 75	Substantial Risk
> 76	High Risk

8. Identified risk: Moderate

9. Narrative / Qualitative Justification: The sub-project has noticeable risk particularly regarding safety of workers and supervisors at site which can be managed by training, strict adherence to safety protocol & use of PPE. Further, there is a risk of traffic congestion if the works are in ghat roads. Traffic has to be managed by proper signage, warning boards and following traffic management plan. But duration of work will be very limited. Risks can be managed with ESMP.

10. ESS Applicability Mapping (for ESMF)

ESS	Applicability
ESS1	Yes
ESS2	Yes
ESS3	Yes
ESS4	No
ESS5	Yes
ESS6	Yes
ESS7	No
ESS8	No
ESS9	No
ESS10	Yes

11. Safeguard Instruments Based on ESS Triggers and Risk Screening & Category

ESIA, ESMP, LMP, SEA/SH Action plan (if required), Traffic Management Plan (if works are in ghat roads)

ANNEXURE 4: E&S RISK CATEGORIZATION TEMPLATE FOR STORM WATER DRAINAGE WORKS AT SMKMC / KMC / IMC

(Read with section 4.2.2 and 5.3)

1. **Name of the sub-project:** Construction and implementation of Storm Water Works for Urban Flood Mitigation in SMKMC / KMC / IMC.

2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4

3. **Table E1: Environmental Screening Matrix** **Maximum Score: 48**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
E1	Location sensitivity (ESS 6)	No	PA / eco-sensitive zone not within 10 km; no wetlands affected.	0
E2	Scale and footprint of civil works (ESS 1).	Substantial	Quantum of work is substantial. approximately INR 6110 million (US $ 76.375). Also, work in densely populated urban area. Impacted persons are high.	3
E3	Construction Related Pollution	Substantial	There will be dust and sound pollution. The work in urban area. Duration of work more (3 years).	3
E4	Natural Resource depletion	Substantial	The scale of work is large. Resources like sand, water, and energy will be largely depleted. Cement & steel consumption will have indirect impact on natural resource depletion.	3
E5	Construction waste generation	Substantial	Quantity of silt/ sludge is approximately 1,28,000 cubic meters. Although, it is planned to be disposed on corporation land. Proper disposal will be a challenge. Besides this construction waste will be generated due to dismantling of old structures.	3
E6	Excavation and dewatering (ESS 3 & ESS 4)	Substantial	Although excavation depth is limited up to 3m it will be in urban area.	3
E7	Alteration in river/drain morphology & flow (ESS 6)	Low	Flow alteration only in few territories drains expected.	1
E8	Risk of construction pollution (dust, noise, etc.) ESS 3, ESS4 & ESS 6)	Substantial	The work duration is about 3 years. Work being in urban area impacted persons are more.	3
E9	Biodiversity impact (Flora and fauna) (ESS 3 and ESS 6).	Moderate	723 trees will have to be cut. Proposed new plantation is 48,000.	2
E10	Flooding risk during construction due to urban	Substantial	The outfalls of the primary drains are in river and river flood levels are higher. Backwater in investable.	3

	runoff and backwater of river (ESS 4)		Unless work done is protected will be silted due to backwater. The work will continue for about 3 years; if at the end of season, construction debris are not removed there would be a risk of local flooding.	
E11	Cumulative Impact	Substantial	In the corporation jurisdiction work will be progress concurrently at multiple locations. Cumulative impact will be substantial.	3
E12	Climate / disaster risk amplification (ESS 1)	No impact	In fact, Proposed wok will reduce flooding risk after completion	0
	Total Environmental Screening Score			**27**

4. Table S1: Social Screening Matrix Maximum Social Score: 36

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
S1	Requirement of Land Acquisition (ESS 5) in Ha	None	As per census survey no necessity of acquisition of private land is not involved.	0
S2	Impact on structures / Physical displacement / Impact on CPRs (ESS 5)/ Impact on livelihoods of business complex / vendors, hawkers, etc. (ESS 5)	moderate	No impact on main structures. As per census survey report, minor impact 81 structures (32 residential + 45commercial+2 CPR + 2 squatters. Impact on appurtenant components such as fencing, compound wall, doorsteps. This impact will be for a short time of about a month. Properties can continue their intended function, even during implementation. Impact on livelihood. As per census survey no necessity of acquisition of private land is not involved.	2
S3	Presence of vulnerable groups (ESS 5)	moderate	As per census survey there exist 26 venerable families.	2
S4	Traffic disruption (ESS 5)	High	Work in urban area. Work duration 3 years. Impact on multiple persons.	4
S5	OHS risks to project workers (ESS 2)	moderate	Deep excavation (about 3 m). Material handling by crane.	2
S6	Risk of community safety issues (open trenches, cutting of roads, construction debris, flooding) (ESS 4)	Substantial	The work is in thickly populated urban area; impact on multiple people. Duration of work is long (3 years). Risk due to excavation, diversion of traffic, movement of heavy vehicles & equipment.	3
S7	Risk due to labour influx.	Substantial	There will be approximately 150 workers working in group of 25, at	3

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
			multiple places in the same city . But construction period is long (3 years).	
S8	SEA/SH risks due to labour influx (ESS 2)	Substantial	There will be approximately 150 workers working at group of 25 at multiple places.	3
S9	Disruption of utilities during construction (shifting water, sewer, power, telecom lines) (ESS 1 & ESS 5)	High	As per census survey volume of shifting of utilities is substantiation. (479 electric poles, 39 transformers, 1235 m of UG water pipeline, 2200 m of gas pipeline)	4
	Total Social Screening Score			**23**

5. **Table I1: Institutional Screening** **Maximum Institutional Score: 12**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
I1	Implementing agency E&S handling capacity.	moderate	E&S staffing & capacity building arrangements made.	2
I3	Past experience of area / PIU	Moderate	Mixed past experience	2
I3	GRM availability	Moderate	Partial availability	2
I4	Regulatory compliance	Moderate	Permission / Permits for working will be required from various authorities.	2
	Total Institutional Screening Score			**8**

6. **Total Maximum Possible Score = 100** **Total Assigned Score: 58**

7. **Risk Categorization Thresholds**

0 – 25	Low Risk
26 – 50	Moderate Risk
51 – 75	**Substantial Risk**
> 76	High Risk

8. **Identified risk: Substantial**

9. **Narrative / Qualitative Justification:** There is no land acquisition involved. Impact on structures is minimal and temporary. The sub-project has noticeable risks of disposal of construction waste and silt, construction related pollution, traffic disruption, utility disruption, labour influx and SEA/SH. Protecting the incomplete work from the backwater of river Krishna and flooding due to urban runoff is also a challenge. The anticipated impacts need ESMP based on detailed assessment and its implementation needs supervision and monitoring.

   Out of the three municipal corporations, anticipated E&S impacts for the works in SMKMC has comparatively sever impacts and hence it is selected as representative corporation for risk categorization.

10. ESS Applicability Mapping (for ESMF)

ESS	Applicability
ESS1	Yes
ESS2	Yes
ESS3	Yes
ESS4	Yes
ESS5	Yes
ESS6	Yes
ESS7	No
ESS8	No
ESS9	No
ESS10	Yes

11. Safeguard Instruments Based on Risk Category: ESIA, ESMP, RAP, Construction Waste Management Plan, SEA/ SH Action Plan, Utility Shifting Plan, Traffic Management Plan, Plan for protecting incomplete work from flooding due to backwater & urban runoff. Implementation needs to be closely supervised.

ANNEXURE 5: E&S RISK CATEGORIZATION TEMPLATE FOR DIGITAL INTERVENTIONS / CAPACITY BUILDING / FEASIBILITY STUDIES

(Read with section 4.2.2 and 5.3)

1. **Name of the sub-project:** Upgradation of the existing Data center at MKVDC, Pune

2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4

3. **Table E1: Environmental Screening Matrix** **Maximum Score: 32**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
E1	Location sensitivity (Proximity to eco-sensitive areas, forest, wetlands) (ESS 6)	No	Sub-projects are located outside influence zone of NP / eco-sensitive zones	0
E2	Scale and footprint of civil works & data center (ESS 1)	Low	Small server room in existing building with minor changes. (5 racks)	1
E3	Generation of E-waste (ESS 3)	Moderate	6 batteries of 65Ah. 3 kVA inverter. 4 racks. E-waste will be generated initially during replacement of batteries and servers. Afterwards, frequency will be 3 to 5 years; Manageable e-waste.	2
E4	Risk of pollution (dust, noise, GHG emission, etc.) (ESS 3)	Low	Dust and noise pollution only during repair works for a period of about 1 month. GHG generation due to diesel generator of 25 kVA, installed as a backup power, to the cooling system (air conditioning to server room); works for about 1 hour per month (as per current scenario).	1
E5	Biodiversity impact (Flora and fauna) (ESS 3 and ESS 6) /	No	The work is within existing buildings.	0
E6	Risk against disasters (flood / fire / earthquake) (ESS 4)	Low	Risk of fire due to short circuit cannot be totally ruled out. However, probability of its occurrence is rare. Data center on 2nd floor of building located outside the flood lines. Building in Zone 3 (earthquake)	1
E7	Climate / disaster risk amplification (ESS 1)	No	Reduces risk	0
E8	Resource Efficiency (Energy Management) (ESS 3)	Moderate	Electrical load 54 kW, annual energy consumption approximately 18,000 kWh (scope for reducing energy consumption by installing energy efficient ACs, lighting and servers).	2

	Total Environmental Screening Score			**7**

4. Table S1: Social Screening Matrix **Maximum Score: 32**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
S1	Requirement of Land Acquisition (ESS 5)	No impact	No land acquisition proposed	0
S2	Physical displacement (ESS 5)	No impact	No land acquisition proposed	0
S3	Risks and impact on cultural heritage (ESS 8)	No impact	No land acquisition proposed. Known site	0
S4	Presence of Indigenous Peoples / vulnerable groups (ESS 7)	No impact	Indigenous people not present	0
S5	Labour & Working conditions OHS risks to sub-project workers (ESS 2)	Low	Only minor OHS risks during maintenance of existing building and electrification. Very limited workers both during construction & operation (<10)	1
S6	Risk of community health & safety issues (ESS 4)	None.	Work premises is isolated from community. In fact ,indirectly helps to increase community safety.	0
S7	SEA/SH risks due to labour influx (ESS 2)	Moderate	Number of workers <10. Duration of construction 1-3 month. During operation presence of female workers can't be ignored. Risk is manageable	2
S8	Stakeholder Opposition (ESS 10)	None	-	0
	Total Social Screening Score			**3**

5. Table I1: Institutional Screening **Maximum Score:16**

Code	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Score Assigned
I1	Implementing agency E&S capacity	Moderate	Appointed E & S nodal officers.	2
I2	Implementing agency digital capacity	Moderate	Presently using since 2012 but needs capacity building	2
I3	Risk of cyber security (firewalls, back-ups, role-based access)	Moderate	No personal data	2
I4	GRM availability	Moderate	Partial	2
	Total Institutional Screening Score			**8**

6. Total Maximum Possible Score = 80 **Total Assigned Score: 18**

7. Risk Categorization Thresholds

0 – 20	**Low Risk**
21 – 40	Moderate Risk
41 – 60	Substantial Risk
> 60	High Risk

8. **Identified risk: Low**
9. **Narrative / Qualitative Justification:** There is no land acquisition involved. The sub-project has some risk of generation of e-waste. However, this risk is easily manageable.

1. **Safeguard Instruments Based on Risk Category:** E&S Screening checklist and ESMP with e-waste reduction & disposal plan.

2. **ESS Applicability Mapping (for ESMF)**

ESS	Applicability
ESS1	Yes
ESS2	Yes
ESS3	Yes
ESS4	Yes
ESS5	No
ESS6	No
ESS7	No
ESS8	No
ESS9	No
ESS10	Yes

ANNEXURE 6: TEMPLATE FOR ASSESSMENT OF SEA/ SH RISK RATING

(Read with section 3.5.1)

1. **Name of the sub-project:**
2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4

Maximum SEA/ SH risk Score: 32

Sr.No	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
1	**Labor influx magnitude**			
2	**Worker–community interaction**			
3	**Presence of vulnerable groups (women, migrants, tribal)**			
4	**Location characteristics**			
5	**Contractor ESHS capacity**			
6	**Community awareness & GRM**			
7	**Past SEA/SH incidents**			
8	**Camp accommodation**			
	Total Score			

3. **Risk categorization thresholds and safeguard instruments:**

Score	Risk	Safeguard instruments
0 – 8	**Low Risk**	Basic CoC, worker induction, GRM with SEA/SH-sensitive intake
8 – 16	**Moderate Risk**	CoC + training + mapping of services + referral pathways
16– 24	**Substantial Risk**	SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness
> 24	**High Risk**	Full SEA/SH Action Plan, specialist hire, survivor support MOUs, strong supervision, contractual penalties, strict restrictions on worker movement

4. **Identified SEA/SH risk category:**

5. **Identified safeguard instruments:**

ANNEXURE 6.1: TEMPLATE FOR ASSESSMENT OF SEA/ SH RISK RATING

(Read with section 3.5.2 and 5.3)

1. **Name of the sub-project:** Retrofitting of existing sluice gates and provision of additional spillway to Radhanagari dam.
2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4

Maximum SEA/ SH risk Score: 32

Sr.No	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
1	**Labor influx magnitude**	Substantial	Majority migrant workers. There will be 50 labours for 2 years.	3
2	**Worker–community interaction**	Low	Limited interaction; controlled access to community.	1
3	**Presence of vulnerable groups (women, migrants, tribal)**	Low	There is no land acquisition or displacement.	1
4	**Location characteristics**	Moderate	Semi-urban, moderate policing, moderate lighting.	2
5	**Contractor ESHS capacity**	Moderate	Contractor with moderate experience; limited SEA/ SH trainings.	2
6	**Community awareness & GRM**	Moderate	GRM exists but not SEA/ SH adapted; low awareness	2
7	**Past SEA/SH incidents**	High	Recurrent SEA/ SH incidents; GBV hotspots.	4
8	**Camp accommodation**	Substantial	long-term (2 years).	3
	Total Score			**18**

3. **Risk categorization thresholds and safeguard instruments:**

Score	Risk	Safeguard instruments
0 – 8	Low Risk	Basic CoC, worker induction, GRM with SEA/SH-sensitive intake
8 – 16	Moderate Risk	CoC + training + mapping of services + referral pathways
16– 24	**Substantial Risk**	SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness
> 24	High Risk	Full SEA/SH Action Plan, specialist hire, survivor support MOUs, strong supervision, contractual penalties, strict restrictions on worker movement

4. **Identified SEA/ SH risk category:** Substantial

5. **Identified safeguard instruments:** SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness

ANNEXURE 6.2: TEMPLATE FOR ASSESSMENT OF SEA/ SH RISK RATING

(Read with section 3.5.2 and 5.3)

1. **Name of the sub-project:** River training works
2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4

Maximum SEA/ SH risk Score: 32

Sr.No	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
1	**Labor influx magnitude**	High	Majority migrant workers. Approximately 300 labours spread over multiple worksites in group of 25 at one site for 3 years.	4
2	**Worker–community interaction**	Moderate	Regular interaction with community	2
3	**Presence of vulnerable groups (women, migrants, tribal)**	Moderate	Some vulnerable groups present; moderate exposure	2
4	**Location characteristics**	High	Remote, rural, no lighting facility, riverine, weak policing.	4
5	**Contractor ESHS capacity**	Moderate	Contractor with moderate experience; limited SEA/ SH trainings	2
6	**Community awareness & GRM**	Moderate	GRM exists but not SEA/ SH adapted; low awareness	2
7	**Past SEA/SH incidents**	Moderate	Some historical cases; moderate reporting	2
8	**Camp accommodation**	Substantial	Camp of approximately 25 workers at one place.	3
	Total Score			**21**

3. **Risk categorization thresholds and safeguard instruments:**

Score	Risk	Safeguard instruments
0 – 8	Low Risk	Basic CoC, worker induction, GRM with SEA/SH-sensitive intake
8 – 16	Moderate Risk	CoC + training + mapping of services + referral pathways
16–24	**Substantial Risk**	SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness
> 24	High Risk	Full SEA/SH Action Plan, specialist hire, survivor support MOUs, strong supervision, contractual penalties, strict restrictions on worker movement

4. **Identified SEA/ SH risk category:** Substantial

5. **Identified safeguard instruments:** SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness

ANNEXURE 6.3: TEMPLATE FOR ASSESSMENT OF SEA/ SH RISK RATING

(Read with section 3.5.2 and 5.3)

1. **Name of the sub-project:** Implementation and maintenance of existing and construction of new flood mitigation water storage structures in Krishna and Panchganga river free catchment in Kolhapur and Sangli districts.
2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4

Maximum SEA/ SH risk Score: 32

Sr.No	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
1	**Labor influx magnitude**	High	Approximately 150 workers at multiple site in a group of 25 for 2 years; Majority migrant workers.	4
2	**Worker–community interaction**	Moderate	Regular interaction with community.	2
3	**Presence of vulnerable groups (women, migrants, tribal)**	Substantial	High presence of vulnerable groups; rural, poor, migrants, female aided households.	3
4	**Location characteristics**	High	Remote, rural, no lighting facility, riverine, weak policing	4
5	**Contractor ESHS capacity**	Moderate	Contractor with moderate experience; limited SEA/ SH trainings	2
6	**Community awareness & GRM**	Moderate	GRM exists but not SEA/ SH adapted; low awareness	2
7	**Past SEA/SH incidents**	High	Recurrent SEA/ SH incidents; GBV hotspots.	4
8	**Camp accommodation**	Moderate	Small short-term camps; basic supervision	2
	Total Score			**23**

3. **Risk categorization thresholds and safeguard instruments:**

Score	Risk	Safeguard instruments
0 – 8	Low Risk	Basic CoC, worker induction, GRM with SEA/SH-sensitive intake
8 – 16	Moderate Risk	CoC + training + mapping of services + referral pathways
16–24	**Substantial Risk**	SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness
> 24	High Risk	Full SEA/SH Action Plan, specialist hire, survivor support MOUs, strong supervision, contractual penalties, strict restrictions on worker movement

4. **Identified risk category:** Substantial for new water storage structures and moderate for desilting / maintenance of old water storage structures.
5. **Narrative / Qualitative Description:** The free catchment works comprised of two types of works, i.e. catchment area treatment works, rejuvenation of existing water bodies and construction of new water storage structures. SEA/SH risks categorization exercise, done above is for the construction new water storage structures. In respect of catchment area treatment works and rejuvenation of existing water bodies, risk of labour influx will be limited. The work period will also be very short of the order of one or two weeks.

6. **Identified safeguard instruments:** SEA/SH Action Plan in respect construction of new water storage structures and dedicated SEA/SH focal point; worker camp rules; community awareness.

   In respect of maintenance of existing water storage structures COC, training and awareness campaign will suffice.

ANNEXURE 6.4: TEMPLATE FOR ASSESSMENT OF SEA/ SH RISK RATING

(Read with section 3.5.2 and 5.3)

1. **Name of the sub-project:** Preparation of Landslide Hazard Assessment & Detailed Project Report for Landslide Mitigation Measures across eight identified sites in Kolhapur District, Maharashtra and implementation of the same.
2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4

Maximum SEA/ SH risk Score: 32

Sr.No	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
1	**Labor influx magnitude**	Substantial	Approximately 25 labours for the duration of 1 month; Majority migrant workers.	3
2	**Worker–community interaction**	Low	Limited interaction; limited access to community.	1
3	**Presence of vulnerable groups (women, migrants, tribal)**	Substantial	High presence of vulnerable groups; rural, poor, tribal, migrants, female aided households.	3
4	**Location characteristics**	High	Remote, rural, no lighting facility, weak policing	4
5	**Contractor ESHS capacity**	Moderate	Contractor with moderate experience; limited SEA/ SH trainings	2
6	**Community awareness & GRM**	Moderate	GRM exists but not SEA/ SH adapted; low awareness	2
7	**Past SEA/SH incidents**	Substantial	Recurrent SEA/ SH incidents; GBV hotspots.	3
8	**Camp accommodation**	Moderate	Small short-term camps; basic supervision	2
	Total Score			**20**

3. **Risk categorization thresholds and safeguard instruments:**

Score	Risk	Safeguard instruments
0 – 8	Low Risk	Basic CoC, worker induction, GRM with SEA/SH-sensitive intake
8 – 16	Moderate Risk	CoC, trainings, mapping of services and referral pathways
16–24	**Substantial Risk**	SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness
> 24	High Risk	Full SEA/SH Action Plan, specialist hire, survivor support MOUs, strong supervision, contractual penalties, strict restrictions on worker movement

4. **Identified risk category:** Substantial

5. **Identified safeguard instruments:** SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness

ANNEXURE 6.5: TEMPLATE FOR ASSESSMENT OF SEA/ SH RISK RATING

(Read with section 3.5.2 and 5.3)

1. **Name of the sub-project:** Construction and implementation of Storm Water Works for Urban Flood Mitigation in Sangli-Miraj-Kupwad Municipal Corporation (SMKMC)/ KMC/ IMC
2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4

Maximum SEA/ SH risk Score: 32

Sr.No	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
1	**Labor influx magnitude**	High	Approximately 150 labours at multiple locations for 3 years in a group of 25 at one site; Majority migrant workers	4
2	**Worker–community interaction**	High	Frequent unsupervised interaction with community; Workers near schools and marketplace.	4
3	**Presence of vulnerable groups (women)**	Low	Urban areas with services.	1
4	**Location characteristics**	Low	Urban, well-lit, good transport, strong policing	1
5	**Contractor ESHS capacity**	Moderate	Contractor with moderate experience; limited SEA/ SH trainings	2
6	**Community awareness & GRM**	Moderate	GRM exists but not SEA/ SH adapted; low awareness	2
7	**Past SEA/SH incidents**	Substantial	Recurrent SEA/ SH incidents; GBV hotspots.	3
8	**Camp accommodation**	Moderate	Small short-term camps; basic supervision	2
	Total Score			**19**

3. **Risk categorization thresholds and safeguard instruments:**

Score	Risk	Safeguard instruments
0 – 8	Low Risk	Basic CoC, worker induction, GRM with SEA/SH-sensitive intake
8 – 16	Moderate Risk	CoC, trainings, mapping of services and referral pathways
16–24	**Substantial Risk**	SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness
> 24	High Risk	Full SEA/SH Action Plan, specialist hire, survivor support MOUs, strong supervision, contractual penalties, strict restrictions on worker movement

4. **Identified SEA/ SH risk category:** Substantial

5. **Identified safeguard instruments:** SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness.

ANNEXURE 6.6: TEMPLATE FOR ASSESSMENT OF SEA/ SH RISK RATING

(Read with section 3.5.2 and 5.3)

1. **Name of the sub-project: Digital Infrastructure based Sub-project such as** Upgradation of the existing Real Time Data Acquisition System (RTDAS), Development of Data Center, DEOCs, Capacity Building activities , feasibility studies, etc.
2. **Rating Scale:** No impact / positive impact: 0, Low:1, Moderate:2, Substaintial:3, High: 4

Maximum SEA/ SH risk Score: 32

Sr.No	Screening Parameter	Assessment of Impact	Justification in Support of Assessment	Assigned Score
1	**Labor influx magnitude**	Low	Approximately 15 workers during implementation and 10 workers during operation; mixed workforce; Majority local workers.	1
2	**Worker–community interaction**	Low	Limited interaction; limited access to community	1
3	**Presence of vulnerable groups (women, migrants, tribal)**	No	Urban areas with services	0
4	**Location characteristics**	Low	Urban, well-lit, good transport, strong policing.	1
5	**Contractor ESHS capacity**	Moderate	Contractor with moderate experience; limited SEA/ SH trainings	2
6	**Community awareness & GRM**	Moderate	GRM exists but not SEA/ SH adapted; low awareness	2
7	**Past SEA/SH incidents**	Low	Some historical cases; moderate reporting	1
8	**Camp accommodation**	No	No camps; Workers commute daily	0
	Total Score			**8**

3. **Risk categorization thresholds and safeguard instruments:**

Score	Risk	Safeguard instruments
0 – 8	**Low Risk**	Basic CoC, worker induction, GRM with SEA/SH-sensitive intake
8 – 16	Moderate Risk	CoC + training + mapping of services + referral pathways
16–24	Substantial Risk	SEA/SH Action Plan; dedicated SEA/SH focal point; worker camp rules; community awareness
> 24	High Risk	Full SEA/SH Action Plan, specialist hire, survivor support MOUs, strong supervision, contractual penalties, strict restrictions on worker movement

4. **Identified SEA/ SH risk category:** Low

5. **Identified safeguard instruments:** Basic CoC, worker induction, GRM with SEA/SH-sensitive intake.

ANNEXURE 7: INDIGENOUS PEOPLES PLANNING FRAMEWORK

(Read with section 10.4.7)

Objectives and Scope

The Indigenous Peoples Planning Framework (IPPF) is a key instrument under the World Bank's Environmental and Social Standard 7 (ESS7). The IPPF applies to all MRDP interventions and subject to adaptation to the context of subprojects in the project areas. Under MRDP, the overall objectives of the IPPF are to ensure that:

- Indigenous Peoples (IPs) / Scheduled Tribes (ST) are adequately identified and meaningfully consulted by the project implementing agencies.
- Any adverse impacts on IPs/STs are avoided, minimized, and/or mitigated adequately;
- Project interventions and processes, services and benefits are accessible, inclusive, and appropriate to social, cultural, and economic practices of IPs/STs;
- a culturally suitable and accessible grievance redressal mechanism is established to resolve any concerns and grievances of IPs related to project interventions;
- project obtains Free, Prior and Informed Consent (FPIC) of tribal people, when applicable;
- appropriate strategies for information sharing, consultations communication and capacity building of tribal stakeholders are implemented
- when required, additional interventions/investments are undertaken to enhance project outreach and benefits to tribal communities through indigenous peoples plans (IPPs)

The specific objectives of the IPPF are to establish requirements, implementation mechanism and provide guidance for:

a. Conducting social screening to establish presence of STs among project beneficiaries or project affected persons in the project area;
b. Conducting meaningful consultations and information disclosure.
c. Participation of IPs/STs in preparation, implementation, and monitoring of sub projects;
d. Preparation of simplified Indigenous Peoples Plans (IPPs), proportionate to the potential risks and impacts, as part of resettlement action plan (RAP) or Environment and Social Management Plans (ESMPs).

Relevant Legal, Policy and Regulatory Frameworks

Constitutional Provisions

Articles 341 and 342: These articles empower the President of India to specify communities as Scheduled Castes and Scheduled Tribes, respectively. For Maharashtra, this has led to the recognition of forty-five tribal communities including Gonds, Bhils, Warlis, and Katkaris, establishing their legal status for protective measures and benefits.

Fifth Schedule: The criteria followed for declaring an area as Scheduled Area are preponderance of tribal population; compactness and reasonable size of the area; under-developed

nature of the area; and marked disparity in economic standard of the people. This schedule provides a comprehensive framework for administration and control of Scheduled Areas in Maharashtra. **MRDP project areas do not have any schedule V areas.**

Article 338A: Establishes the National Commission for Scheduled Tribes as a constitutional body with powers to investigate violations of tribal rights, participate in planning processes, evaluate safeguard implementation, and submit annual reports to the President regarding the condition of tribal communities in Maharashtra and other states.

Article 243D: Mandates reservation of seats for Scheduled Tribes in Panchayats proportional to their population (approximately 9.4% in Maharashtra). This ensures tribal representation in local governance structures, with additional provisions for representation in leadership positions like Sarpanch in areas with substantial tribal populations.

Key Laws

Provisions of Panchayats (Extension to the Scheduled Areas) Act. 1996. The Panchayat (Extension to the Scheduled Areas) Act, 1996, commonly known as PESA, legally recognizes Scheduled Tribe's own systems of self- governance. The Gram Sabha of the village becomes the focal institution, endowed with significant powers. Under section 4(d) of PESA: "every Gram Sabha shall be competent to safeguard and preserve the traditions and customs of the people, their cultural identity, community resources and the customary mode of dispute resolution." PESA legally recognizes the right of tribal communities to govern themselves through their own systems of self-government and acknowledges their traditional rights over natural resources. In line with the PESA Act, the Government of Maharashtra has formulated rules for the Panchayats (Extension to Scheduled Areas) Act, 1996 To further provide regional autonomy, protect the interests of the tribes and improve their status, certain areas of the State have been declared as the Scheduled Areas; these areas are usually populated predominantly by tribes.

Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (also Land Acquisition Act, 2013) is an Act of Indian Parliament that regulates land acquisition and lays down the procedure and rules for granting compensation, rehabilitation, and resettlement to the affected persons in India. The Act has provisions to provide fair compensation to those whose land is taken away, brings transparency to the process of acquisition of land to set up factories or buildings, infrastructural projects and assures rehabilitation of those affected.

Forest Rights Act, 2006. This Act, "Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act," 2006 grants legal recognition to the rights of traditional forest dwelling communities and makes a beginning towards giving communities and the public a role in forest and wildlife conservation. The Act gives rights to the forest dwellers which secure individual or community tenure or both. The Act gives forest rights of forest dwelling Scheduled Tribes and other traditional forest dwellers on all forest lands, namely: (a) right to hold and live in the forest land under the individual or common occupation for habitation or for self-cultivation for livelihood by a member or members of a forest dwelling Scheduled Tribe or other traditional forest dwellers; (b) community rights over forest; (c) right of ownership, access to collect, use, and dispose of minor forest produce

which has been traditionally collected within or outside village boundaries. The Act recognizes 13 forest rights including individual land rights up to 4 hectares, community forest resource rights, and habitat rights for particularly vulnerable tribal groups in Maharashtra. The Act has benefited over 200,000 tribal families in the state's forest regions.

The SCs and The STs (Prevention of Atrocities) Act, 1989. The act was passed in 1989 to prevent Scheduled Castes and Scheduled Tribes from atrocities. Criminalizes specific offenses against tribal communities with enhanced penalties, establishes Special Courts for expedited trials, provides victim compensation up to ₹8.25 lakhs, and creates district-level vigilance committees to monitor implementation in Maharashtra's tribal regions. As per the provision of the act, the State Government shall set up a Scheduled Castes and the Scheduled Tribes Protection Cell at the State head quarter under the charge of Director General of Police/Inspector General of Police.

Maharashtra Scheduled Castes, Scheduled Tribes, De-notified Tribes (Vimukta Jatis), Nomadic Tribes, Other Backward Classes and Special Backward Category (Regulation of Issuance and Verification of) Caste Certificate Act, 2000: Establishes a three-tier verification system for tribal certificates, prescribes documentation requirements, and creates scrutiny committees at district levels to prevent fraudulent claims to tribal status and benefits.

Maharashtra Restoration of Lands to Scheduled Tribes Act, 1974: Empowers district collectors to investigate and restore tribal lands transferred illegally after 1974. The Act creates a presumption in favour of tribals in disputed cases and has facilitated the return of thousands of acres of alienated land across tribal districts of Maharashtra.

Administrative Structures

Tribal Cell in Governor's Secretariat: Established under the Fifth Schedule to assist the Governor in tribal administration. The cell monitors implementation of constitutional safeguards, reviews tribal welfare schemes, prepares annual reports, and coordinates between tribal communities and government departments across Maharashtra's tribal regions.

Tribes Advisory Council: Comprises twenty members with at least fifteen tribal representatives, advising on welfare schemes, development projects, and customary law. The Council meets quarterly to review tribal policies and recommend measures for protecting tribal interests in areas like education, health, and livelihood in Maharashtra.

Scheduled Tribe Certificate Scrutiny Committee: Operates at district levels to verify tribal claims through anthropological studies, genealogical evidence, and community testimonies. The committees prevent benefit misuse by non-tribals and have processed over 100,000 verification cases, ensuring authentic tribal beneficiaries receive government support.

Key Policies and Initiatives

Tribal Sub-Plan (TSP): Allocates 9.4% of Maharashtra's state budget (proportional to tribal population) for tribal development. TSP funds support education, healthcare, livelihood, and infrastructure in tribal areas, with at least 5% directly devolved to Gram Panchayats in Scheduled Areas for local development initiatives.

Ownership of Minor Forest Produce: Grants Gram Sabhas rights over tendu leaves, bamboo, medicinal plants, and other forest products. This policy has generated over ₹100 crore annual income

for tribal communities in Maharashtra through collection centers and minimum support prices for forest produce.

Recruitment Reservations: Provides 7.5% reservation for Scheduled Tribes in state government positions with relaxed eligibility criteria and age limits. Additional provisions include special recruitment drives in tribal areas and preference for local tribal candidates in teaching, health, and forest department positions in Scheduled Areas.

Village Definition in PESA: Maharashtra has modified the standard village definition to recognize traditional tribal settlements (padas) as distinct units for governance. This ensures that tribal hamlets maintain cultural autonomy and decision-making powers even when administratively part of larger revenue villages.

Protection Against Land Alienation: Implements Section 36A of Maharashtra Land Revenue Code prohibiting transfer of tribal lands to non-tribals without collector approval. Special provisions include presumption of tribal ownership in disputed cases, restoration of unlawfully alienated lands, and dedicated tribal land protection cells in each district.

The MRDP project will comply with the World Bank's Environment and Social Standard 7 (ESS7) due to the presence of Indigenous Peoples in Project Area, even though there share in the population is minimal (less than 1 percent). ESS7 ensures their protection and inclusion by requiring identification, consultation, and participation in a culturally appropriate way. It mandates social assessments, development of Indigenous Peoples' Plans (IPPs), avoidance of physical displacement, fair compensation if relocation is unavoidable, and establishment of grievance mechanisms.

Framework for Consultation, Participation and Information Sharing

Screening during DPR preparation. During preparation of DPRs, project proponents will undertake screening to identify the presence of STs and/or their attachment to the project area. If IP/ST households are identified, the screening report will cover the demographic and socioeconomic profile of ST population, along with information on subproject impacts on land, structures, livelihoods, natural sources, cultural properties, common amenities as well as natural resources under customary ownership and use. This process will involve consultations with community members, NGOs, and local self-government representatives. Proposed mitigation measures will be integrated into the Environment and Social Management Plan (ESMP) and/or the Resettlement Action Plan (when applicable).

Free Prior and Informed Consent (FPIC). FPIC is a key principle of ESS7 that ensures that affected Indigenous communities are fully informed, can participate meaningfully in decisions that affect them, and have the power to give or withhold consent. FPIC is applicable when a subproject causes.

- adverse impacts on land and natural resources subject to traditional ownership or under customary use or occupation,
- physical relocation of Tribals from land and natural resources subject to traditional ownership or under customary use or occupation; or
- significant impacts on Tribals' cultural heritage that is material to the identity and/or cultural, ceremonial, or spiritual aspects of the affected Tribals' lives.

Subprojects where FPIC is applicable are not expected under MRDP. However, when applicable, the Project will comply with the requirements of FPIC, consistent with ESS7. Any subprojects that do not obtain FPIC (when applicable) will not be supported under MRDP.

Consultations, Participation and Stakeholder Engagement. During the detailed design phase, project activities and the locations of Indigenous communities, along with their potential impacts, will be finalized. The consultation process involves group discussions and meetings with Indigenous people to gather their views on needs, priorities, and preferences related to project implementation. Focus group discussions will specifically address the impacts and benefits of the project on Indigenous communities. Project will engage with IP beneficiaries, PAPs, and community leaders (informal and elected) throughout the project period, specifically during

a. Preparation of DPRs;
b. Social Screening of DPRs and profiling of IPs;
c. Census Survey and Socioeconomic Survey for preparation of RAPs;
d. Finalisation and Implementation of Resettlement Actions Plans
e. Finalisation and Implementation of ESMPs;

Stakeholder Engagement with Tribal Leaders and Households. A Stakeholder Engagement Plan (SEP) has been prepared with the objectives of i) systematic approach to stakeholder engagement and information disclosure; ii) maintenance of positive relationships with them; iii) monitoring of stakeholder interests and feedback. Key SE activities will target will ensure that the tribal groups are able to engage with the project in socially and culturally meaningful way/language on queries, information disclosure, and grievances. Use of local tribal language will be prioritized in all stakeholder engagement activities, as needed. All ESS plans and documents will be disclosed at country as well as on Bank's website in English and any other local language spoken and understood in the project area.

Mitigating Adverse Impacts and Other Social Risks. Any potential impacts on STs will be avoided, minimised, and mitigated through practice measures. Mitigate any adverse impacts, the project will be undertaking screening of subprojects to establish presence of STs and PAPs. Project interventions near cultural sites and traditional properties will be screened to avoid adverse impacts. The land acquisition/ negotiated purchase strategy of the project will avoid and minimize any land take from IPs. This will be included in the design strategy of the project. Appropriate compensation and livelihood assistance will be provided for affected ST households. Potential health, safety and GBV risks from labour influx will be mitigated through ESMPs and labour management procedures. MRDP will adopt targeting and inclusion criteria for ensuring tribal beneficiaries are suitably represented among participants in project interventions, community institutions as well as beneficiaries.

Indigenous Peoples' Plan (IPP). When needed, simplified Indigenous Peoples' Plan (IPP) will be prepared as part of the Resettlement Action Plan or the ESMP. The implementation of the IPP will maintain a participatory approach, ensuring ongoing consultation and effective participation of Indigenous peoples. A simplified Indigenous people (scheduled tribe) plan of action will be included in the RAP/ ESMP to maximize engagement, consultations, and project benefits for Indigenous communities. This plan will ensure that the needs and concerns of Indigenous Peoples are adequately addressed and that they benefit from the project while minimizing any adverse impacts.

Capacity Building. MRDP will support learning and knowledge sharing for building capacity of local stakeholders, facilitating equal access to critical knowledge and data and promoting broader community resilience-building. The project incorporates provisions for comprehensive capacity development of stakeholders, including tribal communities and stakeholders, including:

- Training of PMU and Project Implementing Agencies on implementation of IPPF and IPP;
- Information sharing and community orientation on MRDP interventions, ESMF and IPPF;
- Deliver targeted assistance/training to IP groups to enhance livelihoods and participation in subcomponents.

Information Disclosure. All ESS plans and documents will be disclosed on MITRA website in English, Marathi as well as other languages spoken and understood in areas where tribals have collective presence. ST households will be informed about the project activities, project benefits, GRM and entitlements through community level meetings, sign boards, and local media and leaders to ensure that tribal communities are well-informed.

ANNEXURE 8: SUSPENDED SEDIMENT (OR SILT) MANAGEMENT PLAN (SSMP)

(Read with section 7.5, 7.9, 7.9)

1. Objective

The primary objective of SSMP is to control suspended sediments during construction, preventing water quality degradation, aquatic habitat harm, and downstream impacts, in line with WB ESS3 and Indian MoEFCC guidelines.

2. Key Components

Standard templates for include:

Project Details	Name, location (e.g., river reach in Maharashtra/WB), WB project ID, contractor, monitoring date.
Sampling Points	Upstream control (100-500m), active work zone, downstream (200-1000m); GPS coordinates, depth.
Parameters	Turbidity (NTU), Total Suspended Solids (TSS mg/L), pH, Dissolved Oxygen (DO), flow rate; lab analysis per IS 3025 standards.
Frequency	Daily during peak works (rainy season), weekly otherwise; post-rain events mandatory .
Equipment	Secchi disk, turbidity meter, grab sampler, portable lab kit.
Mitigation Actions	If TSS >20% above baseline, halt works, deploy silt curtains/fences, enhance settling ponds.

3. Silt Monitoring Report Format

a) **Site Information**

- River/Location: _____
- Date/Time: _____

b) **Monitoring Data**

Point ID	Time	Flow rate	Turbidity (NTU)	TSS (mg/L)	pH	DO (mg/L)	Remarks
Upstream							
Work Zone							
Downstream							

4. Baseline Comparison

- Baseline TSS (from pre-construction): _____ mg/L
- Threshold Exceedance: Yes/No
- Action Taken:

5. Photographs & Sign-off

- Attach GPS-stamped photos of sampling sites.
- Prepared by: _____ Date: _____

6. Actions

6.1 Identify root causes (uncontrolled dredging / bank collapse / improper spoil handling / run-off from stockpiles).

6.2 Control measures

- Stop / modify ongoing activity (temporarily suspend dredging / excavation / reduce working width or equipment intensity)
- Improve construction methodology (use low turbidity dredging methods / avoid dredging during peak flow / reduce drop heights of material / stabilize exposed bank);
- Deploy silt curtains / turbidity barriers;
- Provide temporary coffer dams;
- Construct settling basins;
- Use sandbags / geotextile barriers;

6.3 Implement adaptive management

- Increase monitoring frequency
- Expand monitoring points (upstream / downstream)

6.4 Model contract clause

" In case, TSS levels exceed baseline or prescribed limits, construction activities contributing to sediment disturbance shall be immediately suspended and appropriate sediment control measures such as modifying the construction methodology, turbidity curtains, settling arrangements shall be deployed. Monitoring frequency shall be increased, and corrective measures shall be implemented until test results are restored within permissible limits."

ANNEXURE 9: TEMPLATE FOR SAMPLING, TESTING & DISPOSAL SOP (AS PER CPCB / MPCB) OF DREDGED SILT (ESS 3)

(Read with section 7.9)

1. Objective

To establish a standard protocol for **collection, handling, laboratory testing, classification, and disposal of sediment** in compliance with **CPCB environmental monitoring**, **hazardous waste rules**, and **MPCB disposal requirements**.

Sampling and testing to be done by PIU before bidding and classify the silt / sludge as hazardous waste and non-hazardous waste and prescribe the disposal methodology and locations in the bidding document.

2. Primary legal framework

- Hazardous and other wastes (Management and Transboundary movement) Rules, 2016.
- Solid Waste Management Rules, 2016.
- Water (Prevention and Control of Pollution) Act, 1974.
- CPCB Environmental Monitoring Guidelines outline sampling, monitoring, quality assurance, and analysis for sediment environments.
- CPCB guidelines for contaminated soils highlight scientific methods for collecting soil/sediment samples.
- MPCB Hazardous Waste Management rules and SOPs govern classification, authorization, transportation, and disposal of hazardous sediments.

3. Sediment Sampling Protocol

3.1 Pre-Sampling Requirements

a) **Reconnaissance Survey**

Follow CPCB water quality monitoring strategy: reconnaissance, network design, and resource assessment to select sampling locations.

b) Health & Safety

Use PPE and follow safety directives; similar precautions referenced in international sediment sampling SOPs (EPA).

c) **Equipment Preparation**

- Stainless steel scoops/spoons, corers, dredges based on sediment depth/type.
- Clean equipment using non-phosphate detergents and rinse with distilled water.

3.2 Sampling Methodology

a) Surface Sediment Sampling (0–5 cm)

- Use stainless steel scoops or grab samplers.
- Avoid disturbance of surrounding area to prevent cross-contamination.

b) Subsurface Sampling (>5 cm)

- Use sediment coring devices to obtain stratified samples.
- Record core depth, soil texture, colour, odor.

c) Composite Sampling (If required)

- Combine equal portions from multiple points within the same sampling grid as suggested in CPCB soil/sediment guidelines.

3.3 Sample Handling & Preservation

- Place sediment in high-density polyethylene (HDPE) containers.

- Maintain **4°C** and transport to laboratory within **24 hours**.
- Follow laboratory chain-of-custody documentation requirements per CPCB monitoring guidance.

4. Laboratory Testing Protocol

Required Analyses

Testing shall follow CPCB/standard environmental testing parameters:

a) **Chemical Parameters**
- **Heavy metals** (Pb, Cd, Cr, Hg, Ni) — as per soil contamination guidelines.
- **Nutrients** (N, P, organic matter)
- **Organics**: PAHs, hydrocarbons — required for dredged material assessment.

b) **Elutriate Tests (When Disposal into Water is Considered)**
- Elutriate and modified elutriate tests, following industry procedures used for dredged sediment testing.

5. Sediment Classification (for Disposal Route Selection)

a) **Non-Hazardous Sediment**

Generally, silt is treated as non-hazardous if it originates from storm water drains or natural water bodies (no industrial effluent mixing) provided test results are in permissible limits.
- Meets CPCB permissible limits for metals/organics under water quality monitoring guidelines.

b) **Hazardous Sediment**

The silt is classified as hazardous, if it contains heavy metals above threshold, limits specified in Schedule II of **Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016** adopted by MPCB.
- Requires authorization and use of Common Hazardous Waste Treatment, Storage, and Disposal Facility (CHWTSDF) in Maharashtra.

6. Disposal SOP (Aligned with CPCB/MPCB)

6.1 For Non-Hazardous Sediment

Reuse/Recycling
- Engineering fill
- Landscaping
- Agriculture (only after confirming compliance with CPCB parameters)

6.2 For Hazardous Sediment

a) **Authorization**
- Obtain hazardous waste authorization under MPCB procedures.

b) **Manifest System**
- Maintain tracking documentation as required under MPCB hazardous waste transport rules.

c) **Transportation**
- Use MPCB-authorized transporters for hazardous waste.

d) **Final Disposal**
- Send to nearest CHWTSDF (e.g., Ranjangaon facility, Taloja facility).
- Follow storage and disposal timelines (within 90 days if stored onsite).

7. Documentation & Reporting

- Sampling sheets, GPS coordinates, field observations
- Laboratory results with QC reports
- Waste classification records
- MPCB manifests (if hazardous)
- Disposal certificates from CHWTSDF

8. Review & Updates

Update SOP based on revisions to CPCB/MPCB guidelines, including new monitoring norms and hazardous waste SOPs.

ANNEXURE 10: TERMS OF REFERENCE (TOR) CHECKLIST FOR SOFT INTERVENTIONS

(Read with section 7.7.1)

Consistent with Environmental and Social Standards (ESS 1 to 10) for studies, master plans, early warning systems, data centers, etc.

Section	Checklist Requirements for Soft Interventions
1. Background & Context	• Description of project context and purpose of the sub-project / intervention.
2. Objectives of the Assignment	• To identify the Environmental and Social risks associated with the intervention / subproject; • E&S risk categorization; • Designing appropriate safeguard instruments.
3. Scope of Work – ESF Requirements	**A. Baseline and Diagnostics** • Assess environmental conditions (ecosystems, pollution, hazards, natural resources). • Assess social conditions prevailing in the sub-project implementation area (vulnerable groups, gender issues, livelihoods, land use, cultural heritage). **B. Institutional Review** • Identify agencies responsible for environmental/social risk management. **C. Stakeholder Engagement** • Identify all relevant stakeholders, focusing on traditionally excluded groups. • Require consultations during early diagnostic and draft outputs. **D. Alternatives / Scenario Analysis** • Assess environmental and social implications of planning or technical options; • Require consideration of sustainable and inclusive alternatives; • Assessment of different alternatives to arrive at alternative with minimum E&S impact; **E. Future Risk Screening** • Screen potential environmental and social risks of future downstream investments. • Provide guidance on ES instruments required in the future (ESIA/ ESMP/ RAP/ IPP etc.).
4. E&S Requirements for Specific Soft Interventions	**A. Feasibility Studies & Master Plans** • Integrate ES constraints and opportunities into modelling and spatial planning. • Include cumulative impact considerations. **B. Early Warning System (EWS) Upgrades** • Include social accessibility of warnings (language, gender, disability inclusion). • Consider environmental impacts of sensors/equipment installation. • Integrate community-based early warning needs and local knowledge. **C. Risk-Financing Tools** • Incorporate social vulnerability and livelihood exposure in financial modelling. • Ensure transparency and inclusion in benefit distribution (e.g., payouts, triggers). • Assess affordability impacts on marginal groups.
5. Methodology	• Field visits and preparation of screening checklist;

<table>
<tr><th>Section</th><th>Checklist Requirements for Soft Interventions</th></tr>
<tr><td></td><td>• The work will include desktop level review of relevant documents, field assessment including consultation with relevant stakeholders;
• Describe how ESF principles will guide data collection, modelling, and analysis;
• Spatial outputs (maps, models) integrating ES layers;
• Mapping of exclusion areas, project implementation area, the field observations, ecological, and social vulnerability information in GIS layers.</td></tr>
<tr><td>Scope of services</td><td>• E&S risk screening with the help of checklist appropriately designed to suit the nature intervention and field visits;
• Assessment of risk categorization (low, moderate, substantial and high);
• Impact identification;
• ESS compliance: Mapping of triggers for ESS1 to ESS10.
• Mitigation and gaps: Propose appropriate safeguard measures consistent with National / State / World Bank ESS standards, responsibility matrix and cost estimation;
• Stakeholder engagement;
• Institutional screening and designing capacity building plan.</td></tr>
<tr><td>6. Team Composition & Expertise</td><td>
<table>
<tr><th>Role</th><th>Minimum Qualification</th><th>Minimum Experience</th></tr>
<tr><td>Team Leader</td><td>Postgraduate in field relevant to intervention</td><td>• 12 years' consulting experience in domain relevant to the intervention.
• Experience of handling minimum 1 project as team leader or 2 projects as deputy team leader on externally aided projects (WB, ADB, JICA, etc.)</td></tr>
<tr><td>Environment safeguards specialist</td><td>Master's degree in environmental science or environmental engineering / planning</td><td>• Minimum experience of 10 years in preparation of ESIA and ESMP of projects and shall have completed at least 4 projects related to ESIA and ESMP;
• Experience in interventions of similar nature;
• Experience of implementing externally aided projects (WB, ADB, JICA, etc.)</td></tr>
<tr><td>Social Development Specialist</td><td>Master's degree in social sciences / sociology / anthropology</td><td>• Minimum 10 years of experience in SIA and designing social safeguard management instruments, in which minimum 4 projects shall have completed.
• Experience of implementing externally aided projects (WB, ADB, JICA, etc.) will be of added advantage.
• Experience of handling projects of similar nature is preferable.</td></tr>
</table>
</td></tr>
</table>

Section	Checklist Requirements for Soft Interventions
	Communication / Stakeholder consultation specialist | Graduate in mass communication / sociology or equivalent. Master's degree in mass communication or sociology will be of added advantage. | • Minimum 10 years of experience in design and implementation of mass communication / awareness generation / outreach programs.
7. Expected Deliverables	• Inception Report including outline of consultant's understanding on the assignment, scope, client's needs and expectation, approach and methodology, tools and techniques to be used, stakeholder identification and engagement plan, detailed work plan aligned with World Bank ESF approach and standards; • Monthly progress reports; • E&S screening reports, Stakeholder consultation reports, Risk Categorization Analysis; • E&S safeguard measures including ESMP and other relevant management plans based on identified potential E&S risks. • Institutional gaps and capacity building plan; • Draft reports reflecting E&S risks, E&S risk categorization analysis, SEA/ SH risk categorization analysis, safeguard instruments along with supporting documents such as screening data, stakeholder consultation reports, guidance note on potential E&S safeguard instruments, etc.; • Spatial outputs (maps, models) integrating ES layers.
8. Compliance Requirements	• Align with National and State Environmental and Social statutes; • Align with ESF standards (ESS1–10); • Include labor, gender, community health and safety considerations where relevant; • National / State guidelines relevant to the intervention / subproject.
9. Ethical and Data Standards	• Ensure data privacy and ethical handling of community information. • Require inclusive data collection (gender-disaggregated, vulnerable groups, disability).
10. Quality Assurance & Review	• Draft reports to be reviewed by the client (PIU/ PMU); • Require validation workshops including vulnerable stakeholder groups.
11. Timelines for deliverables	• To be specified considering the scope of work.
12. Annexes to Attach in ToR	• Sample ES screening form for soft interventions;

ANNEXURE 11: SUB-PROJECT SPECIFIC LABOUR REQUIREMENTS

(Read with section 6.2)

Sr. No.	Project Activities	Labour Requirement Nos. (Approx.)	Location	Duration	Skills required
1	**Direct Workers**	10	PMU / PIU Office	5 Years	Domain Experts
2	**Contract Workers**				
2.1	Consulting services for DPR preparation, PMTC, E&S and Documentation, E& Monitoring etc.	25	PMU / PIU Office / Consultants office/Site	5 Years	Domain Experts
2.2	Upgradation of the existing Real Time Data Acquisition System (RTDAS)	15	SDC & Multiple site locations	6 Months	Domain Experts
2.3	Upgradation of Data Centre at Pune	10	SDC at Pune	6 Months	Domain Experts
2.4	Strengthening existing Real Time Stream Flow and Decision Support System (RTSF and DSS), i.e. operation flood forecasting system and developing Climate Informed Integrated Operation and Management System	10	SDC at Pune	6 Months	Domain Experts
2.5	Website Development for Flood Alerts, Flood Related Data and Information Dissemination	10	SDC at Pune / Consultant's office	6 Months	Domain Experts
2.6	Remodeling of spillway and retrofitting of service gates of Radhanagari dam	50	Radhanagari dam site	2 Years	Skilled (10) + Semi-skilled (15) +unskilled (25)
2.7	Replacing the hydraulically inefficient Sangli KT Weir with barrage;	50	Work site at Sangli	2 Years	Skilled (10) + Semi-skilled (15) +unskilled (25)
2.8	Rejuvenation of Existing Natural Drainage System draining into Krishna River	100	Spread over Multiple Worksite	1 years	Skilled (20) + Semi-skilled (30) +unskilled (50)
2.9	Rejuvenation of Existing Natural Drainage System draining into Panchganga River	100	Spread over Multiple Worksite, group of 25 at one site	1 years	Skilled (12) + Semi-skilled (24) +unskilled (64)
2.10	River Training Works (To be finalized after river flow modelling)	300	Spread over Multiple Worksite. Group of 25 at one site	3 Years	Skilled (48) + Semi-skilled (96) +unskilled (156)

Sr. No.	Project Activities	Labour Requirement Nos. (Approx.)	Location	Duration	Skills required
2.11	Capacity Building Strengthening for Data Analysis, Data Management for Data Centre and Software Manpower for additional 05 years after Project implementation	5	SDC at Pune	5 Years	Highly skilled domain experts
2.12	Desilting and maintenance of existing and construction of new flood mitigation water storage structures in the free catchment of Krishna and Panchganga River in Kolhapur and Sangli districts	150	Multiple site locations Group of 25 at one site	2 Years	Skilled (24) + Semi-skilled (48) +unskilled (78)
2.13	Implementation of Detailed Project Report (DPR) for Urban Flood Management in Sangli, Miraj and Kupwad	150	Multiple site locations Group of 25 at one site	3 Years	Skilled (24) + Semi-skilled (48) +unskilled (78)
2.14	Implementation of Detailed Project Report (DPR) for Urban Flood Management in Kolhapur	150	Multiple site locations Group of 25 at one site	3 Years	Skilled (24) + Semi-skilled (48) +unskilled (78)
2.15	Implementation of Detailed Project Report (DPR) for Urban Flood Management in Ichalkaranji	150	Multiple site locations Group of 25 at one site	3 Years	Skilled (24) + Semi-skilled (48) +unskilled (78)
2.16	Preparation of Landslide Hazard Assessment & Detailed Project Report for Landslide Mitigation Measures across eight identified sites in Kolhapur District, Maharashtra and implementation of the same.	10	Work Site/ office	1 Month at one site	Skilled (10)
2.17	Landslide DPR Implementation	25	Work sites	1 Month	Skilled (5) + Semi-skilled (5) +unskilled (15)
2.18	Services of Integrated Emergency Operation Centre (EOC) Management Suites (IEMS) for EOCs	25	Work Site	1 Year	Skilled (5) + Semi-skilled (5) +unskilled (15)
2.19	Development of the Climate inclusive multi-hazard vulnerability assessment for Maharashtra (HRVA, DRDB, Dynamic and Digital Disaster Risk Assessment) and integration with IEMS	10	Data Centre	6 Months	Highly Skilled domain experts

Sr. No.	Project Activities	Labour Requirement Nos. (Approx.)	Location	Duration	Skills required
2.20	Flood EW Dissemination System for the Krishna Basin (mechanism (TBD), after onboarding IEMS consultant, WRD/MKVDC) and integration with IEMS.	10	Data Centre	6 Months	Highly Skilled domain experts
2.21	Development & Installation of Land slide EWS (Local Systems Lo-LEWS) and integration with IEMS (mechanism (TBD) after completion of landslide hazard and risk assessment study under the consultancy services for mitigation works in 8 sites of Kolhapur district)	15	Work Sites	6 Months	Highly Skilled domain experts
2.22	Development of Digital Platform for disbursement of premium subsidy to beneficiaries	10	Data Centre / Consultant's Office	6 Months	Highly Skilled domain experts
2.23	Strategic Study and Capacity Building for Knowledge Framework and Resilience Development cities, including detailed GIS study for city resilience	10	Client's Office	1 Year	Highly Skilled domain experts
2.24	Resilience and Feasibility Analysis for River Flooding Resilience and Disaster Resilience and Development of Knowledge Lighthouse for resilience in Maharashtra, including institutionalization of NDMA guidelines	15	Client's Office	1 Year	Client's Office

ANNEXURE 12: FORMAT FOR GRIEVANCE

(Read with section 9.6)

Following is the format for documenting the grievance/s received

Grievance Number:	
Location:	
District:	
Village:	
CDC Name:	
Name of the Complainant:	
Address:	
Telephone:	
Date Received:	

Classification of the grievance (Check boxes)

- **Dispute with contractors**
- **CDC formation**
- **Inter-community dispute**
- **Land acquisition and Compensation**
- **Technical/operational coordination**
- **Damage to public roads due to contractors and machinery**
- **Financial**
- **Process delays**
- **Air/ Dust Pollution**
- **Water pollution**
- **Noise pollution**
- **Sanitation**
- **Water Use**

- **Gender Based Violence**
- **Sexual Harassment**
- **Other (specify)**

Brief description of the grievance:

What is the perceived cause?

Suggested action (by complainant) to address grievance:

ANNEXURE 13: FORMAT FOR MONITORING OF GRIEVANCE RECEIVED AND REDRESSED

(Read with section 9.6 and 9.8)

Following is the Format for Monitoring of grievances received and redressed

(To be submitted quarterly by the PIU to PMU)

Particulars	Quarters				
	Q1	Q2	Q3	Q4	Cumulative Total
No. of cases referred to GRC					
No. of cases settled by GRC					
No. of cases pending with GRC					
Average time taken for settlement of cases					
No. of GRC meetings					
No. of PAPs moved court					
No. of pending cases with the court					
No. of cases settled by the court					

ANNEXURE 14: BRIEF SUMMARY OF STAKEHOLDER CONSULTATIONS DONE

(Read with section 4.4 and 6.3.6)

1. Details of the stakeholder consultations

Stakeholder consultations have been carried out in the Project area with a broad spectrum of stakeholders comprising of local communities, elected representatives, officers of the line department and NGOs. The details of the stakeholder consultations conducted are summarized below.

Sr. No.	Date of consultation	Location	Participants
1	24th Dec 2024	Flood hotspots in Kolhapur	Local citizens
2	25th Dec 2024	Flood hotspots in Kolhapur	Local citizens
3	26th Dec, 2024	Flood hotspots in Sangli-Miraj-Kupwad	Local citizens
4	27th Dec, 2024	Flood hotspots in Sangli-Miraj-Kupwad	Local citizens
5	7th March, 2025	Collector Office Sangli	73
6	8th March 2025	Collector Office Kolhapur	96
7	11th July 2025	Municipal Corporation Ichalkaranji	120
8	25th Aug, 2025	Office of MKVDC Pune	32
9	12th Sept, 2025	Radhanagari Dam site	54

2. Focus Group Discussions in Kolhapur, (December 24-25, 2024)

Focus Group Discussions (Pilot basis) were carried out at two locations a) Sutarwada and b) Vijay Apartment near Venus Talkies chowk.

Residents of Sutarwada and shop owners of Vijay Apartment are affected almost every year, due to the riverine flood, as these settlements are at lower altitude. Sutarwada is a basically land of private trust and residents are tenants.

However, the civil works proposed, proposed under component-2 of MRDP (urban stormwater drainage system) will have no material impact on residential and commercial structures of Sutarwada and Vijay Apartment.

Figure 8: Public Consultation with the residents of Sutarwada , Kolhapur

The observations recorded and feedback received at both the locations are more or less identical and are as listed below:

(i) Jayanti nalla is just 200 meters from the Sutarwada.
(ii) The area has both residential and commercial structures (mixed zone). The commercial structures are mainly fabrication and welding and manufacture of bullock cart.
(iii) The residents and commercial workshop owners are not ready to relocate as they are dependent on the area for their livelihood.
(iv) During rainy season flood water from near nalla enters in the houses and they have to relocate in the shelters.
(v) The area was under stagnant water for 15 days. Stagnant water and accumulated silt, is affecting the livelihood of the people;
(vi) Snakes and other reptiles are often found in the houses due to the flood and especially during rainy season.
(vii) As per the perceptions of the people the reasons behind heavy floods are:

- The flood is immediately noted when Kalamba reservoir is overflowed
- Solid waste dumped in the nalla / drain illegally
- Big trees collapsed in the nalla and not removed timely
- Encroachment on the banks of nalla between HFL and LFL
- No sediment removal from long time from nalla
- No place for flood water flow due to urban development in the area

3. Focus Group Discussions (FGD) in Sangli (26 to 27 December 2024)

Figure 9: Public Consultation at Maruti Chawk, Shivaji Putala Area, Sangli

For Public Consultation were carried out, in frequently and worst affected areas a) Maruti Chowk b) Station Road c) Suryawanshi plot and d) Shamrao Nagar.
The observations recorded and feedback received at both the locations are more or less identical and are as listed below:

(i) Maruti Chawk, Shivaji Putala is vegetable and grocery market area, in the immediate impacted zone, due to riverine flood;
(ii) There are about 100 to 110 shops and more than 50 road vendors;
(iii) During 2019 flood more than 10 feet water level rise is experienced in this area which lasts for 5 to 6 days.

(iv) No sewer drains and hence sewage water mixes with storm water
(v) Snakes, rodents and other reptiles come inside houses during flooding and creating dangerous situations
(vi) The reason behind heavy flood as perceived by the stakeholders are the following:

- Uncontrolled urban development;
- Gutter line are blocked because of solid waste disposal;
- Gutter line is not cleaned, and sediment/silt is not removed frequently;
- Gutter lines are not repaired and in dismantled conditions at many locations;
- Vendors in the area are throwing illegally solid waste like plastic waste, packing materials, vegetable waste, thermacol, plastic bottles in the drainage
- Width of gutters/drains is not adequate

(vii) Suggestions given by FAP

- Solid waste should be removed from drains frequently
- Strong laws with continuous vigilance should be implemented against illegal solid waste disposal in the drains through solid waste execution by SMC
- Rehabilitation/reconstruction/widening of SWD is necessary
- Silt/sediment should be removed from drains

4. Stakeholder consultation in Sangli-Miraj-Kupwad Municipal Corporation(SMKMC) (Date: March 7, 2025)

Figure 10: Stakeholder consultation in Sangli-Miraj-Kupwad Municipal Corporation(SMKMC)

Input Received in Consultation Process are as listed below:

(i) Inputs on flooding

- There is a gross negligence in protecting the natural drains; blocking of the drains due to buildings, compound walls, land development activities and disposal of solid waste are commonly observed. All historical nallas should be traced with the help of toposheet records, historical satellite imagery and should be restored.

- The unauthorized buildings, compound walls and embankments / fillings on the natural nallas should be removed.
- Near the river brick manufacturers have disturbed the nalla courses; They should be restored.
- Has been rainwater harvesting policy since 2006; but it is not being implemented.
- In ward no 10, cross drainage work constructed by the railway authority is inadequate.
- Storm water drainage system will not succeed unless solid-waste management is done; Bins need to be placed at public places.

(ii) **Input on E&S Aspects:**

- Water stagnation is observed at many places. The potential reasons are inadequate capacity of cross drainage works or blockage of drainage system; Culverts of adequate capacity should be provided to avoid stagnation of water and mosquito breeding.
- Shari nalla is a major source of pollution; Mixing of effluent / sewage and stormwater should be avoided. Biological treatments should be used.
- In ward no. 7, sewage is mixed in storm water.
- Presently, solid waste management is a critical issue which may become more severe during implementation; solid waste management plan should be prepared and implemented to avoid disposal of solid waste in the natural drains.
- Construction activities will cause water and air pollution.
- Mitigating measures need to be adopted to protect existing flora and fauna.
- Social impact can be minimized by conveying the construction schedule in advance.
- Traffic management can be done with public participation.
- There will be increased employment due to the project.
- Existing stormwater drainage system has risks such as water stagnation, water logging and related diseases.
- Disposal of silt and solid waste during implementation should be carefully planned and monitored.
- Health check- up programs should be arranged in labour camps.
- Deployment of local labour will help in minimizing the impact.

5. Stakeholder consultation in Kolhapur Municipal Corporation (KMC) (Date: March 8, 2025)

The stakeholder consultation initiative got a very good response from the stakeholders. Experts in the fields, environmental experts, social experts, non-governmental organizations, volunteer organizations, representatives of the institutes, architect association and line departments participated in the consultation process. In all ninety-six stakeholders participated in the morning secession. Some stakeholders contributed through written communication. The consultation was successful in drawing the active discussions, feedback and generating insights from stake holders.

Figure 11:Stakeholder consultation in Kolhapur Municipal Corporation(KMC)

The gist of the inputs received is as below

(i) **Bridges have become bottlenecks for flow of flood water.**

- The waterways of Shivaji bridge, Shye bridge, Shiroli Bridge and National Highway bridge have proved to be inadequate. The embankments on both sides of the bridges are causing flood situations. Due to these hydraulically inefficient structures, water level rises by about 1 m. Additional waterways need to be provided by pushing the boxes through approach embankments.
- Construction debris at bridge site have not been removed from the riverbed. The debris of bridge dismantled for 6-laning are not removed. The filling done in the river bad for casting yard near Bawada bridge is not removed.
- (c) The left spans of Shiroli bridge are silted.
- In between Ankali & Rajapur there are 16 bridges; the waterways of these bridges are inadequate.

(ii) Sudden Release of Water from Radhanagari dam: The gates of Radhanagari dam open automatically when the level is reached to its Full Reservoir Level. This causes sudden release of water in the river which results in flooding. This can be avoided by gradually releasing the water through river slices. However, these river sluices are not working properly. Hence, its repairs should be done on priority.

(iii) Other Obstructions to River Flow:

- Panchaganga rivers and tributaries are not in their natural state. Due to man-made interventions significant siltation has taken place. If such silt is removed, without impacting on the environment, the river flow will remain in banks.
- The river cross section has been reduced due to trees on banks.
- The sugarcane crop on the banks is causing flood; Same may be reduced.
- The structures in the floodplains (blue lines) such ghats, jack wells, cremation shades which are obstructing the flow of rivers should be removed.

(iv)Water conservation Works: During the 2019 flood event, the contribution of free catchment was significant. Therefore, water conservation works need to be implemented on free catchment in mission mode.

(v)Interventions Required in Corporation Area:

- The unauthorized buildings, compound walls and embankments / fillings on the natural nallas, particularly on More-wadi nalla, Gomati nalla and Jayanti nalla should be removed;
- The Kolhapur city is on one bank of river Panchaganga; To protect the nallas in the city, nalla NOC should be considered while granting building permissions;
- All historical nallas should be restored with the help of toposheet;
- Solid waste management plan should be prepared and implemented
- Treatment plants should not be located near natural nallas (just to avoid pumping);
- Implementation of rainwater harvesting should be watched;
- During 2019 flood water came initially from Kalamba tank side; Therefore, catchment upstream of Kambala tank should be treated;
- The outlets of Rankala tank need to be made operative. These outlets can be utilized for emptying the tank before onset of monsoon and the storage capacity so created can be utilized for moderating the flood peaks;
- The storage capacity of silted waterbodies should be revived;
- Shenda Park: K.T. weir is damaged; Its storage capacity should be increased;

(v)Inputs on Environmental Aspects:

(i) Water stagnation at existing culvert locations, due to their inadequate capacities, is a major concern in the existing system.
(ii) Construction activities will cause water and air pollution.
(iii) Mitigating measures need to be adopted to protect existing flora and fauna; In Kolhapur district there exist rare/unique species which should be protected and if not possible should be replanted.
(iv) Presently, waste management is a critical issue which may become more severe during implementation.
(v) Environmental impacts can be mitigated by environmental, biodiversity and waste disposal management.

(vi)Inputs on Social Aspects:

(i) Utility services and pumping stations of the existing drinking water schemes go underwater during flood; This causes severe drinking water problem. Protective measures should be taken to ensure uninterrupted drinking water supply in flood prone area.
(ii) To have uninterrupted supply of cooking gas, alternative gas pipelines should first be provided before dismantling the existing gas pipelines coming in the project area.
(iii) Displacement of encroachers needs to be addressed during implementation.
(iv) Social impact can be minimized by conveying the construction schedule to the citizens in advance.
(v) Traffic management can be done with public participation.
(vi) There is a scope for increased employment due to the project.

(vii)Input on Health & Safety Aspects:

(i) Existing stormwater drainage systems have risks such as water stagnation, water logging and related diseases;
(ii) Disposal of silt and solid waste during implementation should be carefully planned.
(iii) Health check- up programs should be arranged in labour camps.
(iv) Deployment of local labour will help in minimizing the social impacts;

(viii)Inputs on Communication and Participation:

(i) Stakeholder participation should be done regularly during implementation.
(ii) Majority stakeholders indicated that they would like to receive project information on corporation website and stakeholder meetings.

6. Stakeholder Consultation at Radhanagari (12th September 2025)

Figure 12: Stakeholder Consultation at Radhanagari

The gist of the information provided to the stakeholder is as below:

(i) No land acquisition, displacement or additional submergence is required for the execution of the proposed work. The land holding of 2.31 Ha, in possession of the WRD will be used for this work.
(ii) All excavations will be done by breakers; There will not be any risk to the dam during execution;
(iii) For the tail channel, 80 tress will have to be cut;
(iv) The said work will be completed in 2 years;
(v) During construction there will not be any impact on irrigation or domestic water supply;
(vi) After the implementation of the proposed work, safety of the dam will be increased.

The gist of the feedback received from the stakeholder is as below:

(i) Existing automatic gates has cultural value and hence needs to be preserved;
(ii) The service gates needs to be maintained and kept in operation;
(iii) The old powerplant closed by MAHAGENCO, should be made operational;
(iv) Silt accumulated in the dam is causing flooding and hence needs to be removed;
(v) Direct the excess water from dam to Konkan area (towards sea) by digging a tunnel near Dajipur;
(vi) Leakage through the service gates should be stopped;
(vii) Automatic gates will not function once the additional spillway is provided which will destroy the cultural heritage;

7. Stakeholder consultation at Pune on upgradation of RTDAS / RTSF / Data center (25 August 2025)

The gist of the feedback / input received from the stakeholders is as below:

(i) Out of the 149 rain gauge stations, 3 are non-functional. Similarly, out 31 stream flow stations, 4 are non-functional;
(ii) During 2019 flood event, contribution of free catchment was significant. This prompts necessity of establishing additional rain gauge stations;
(iii) The existing RTDAS devices were installed in 2012-13 and have become technologically obsolete;
(iv) The GSM / GPRS modems are based on 2G/ 3G networks, leading to data transmission failures;
(v) Weather sensors (old GILL, MET, PACK-2 sensors) have reached end of life and hence there is a risk of inaccurate data;
(vi) Presently, the dam operators are relying more on their traditional wisdom and experience for flood management, rather than RTDAS and flood forecasting systems. Capacity building of all dam operators is necessary to use the RTDAS and RTSF system with confidence;
(vii) During rainy season, solar panel-based batteries are not sufficiently charged, and it is difficult to change the batteries during heavy rains;
(viii) Existing RTDAS and RTSF system is for entire Krishna basin, including Bhima basin. In MRDP, DEOC are being developed for every district. The triggers for this DEOCs, will be given from these systems. Therefore, it would be appropriate, to upgrade the RTDAS equipment in Bhima basin also;
(ix) RTDAS is required to be provided at newly proposed additional spillway for Radhanagari dam and spillway of Dhamni dam;
(x) Out of the 3 servers in the data center, 2 are outdated (procured in 2012) and needs to be replaced;
(xi) RTSF system experiences slowdowns, with model run time of 40 to 45 minutes.

ANNEXURE 15: ESDD TEMPLATE

(Read with section 7.1.4)

EXECUTIVE SUMMARY

- Project Overview;
- Nature of Activities;
- E&S risks and gaps;
- Risk categorization;
- Summary of safeguard measures;

CHAPTER 1: INTRODUCTION

1.1 Project Overview

1.2 Sub-Project Description

1.3 Sub-project specific activities involved

1.4 Implementation Arrangement and Schedule

1.5 Purpose of ESDD

1.6 Approach and Methodology adopted for ESDD

CHAPTER 2: INSTITUTIONAL FRAMEWORK AND CAPACITY ASSESSMENT OF IA

2.1 Policy and Legal Framework

2.2 Description of Institutional Framework

CHAPTER 3: ASSESSMENT OF ENVIRONMENTAL AND SOCIAL CONDITIONS

3.1 Physical Environment

3.2 Protected Area

3.3 Social Environment

3.4 Cultural Environment

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

4.1 Sub-Project Screening

4.2 Stakeholder Consultation

4.3 Non-Structural Interventions

4.4 Risk and Impact Identification for the Screened Activities

CHAPTER 5: RISKS ANALYSIS CLASSIFICATION AND RECOMMENDATIONS

5.1 Environment and Social Standards Triggered

5.2 Risk Classification

5.3 Recommendations

List of Figures

ANNEXURE 16: GENERIC ESMP

(Read with section 4.2 and 7.5)

No.	E&S Aspects	E&S Risks	Mitigation/ Management Measures
			ESS 2
1	Occupational Health and Safety	• Injuries, disabilities, fatalities to workers due to accidents at workplace	• Prepare site specific, Occupational Health and Safety (OHS) plan, after carrying out, 'job hazard analysis. OHS Plan should be 'in compliance with the World Bank Group's EHS Guidelines, national regulations and the Labour Management Procedures developed by MITRA. • Implementation of the OHS plan with zero tolerance; • Appoint of qualified and experienced Safety Officers, who will dedicatedly work and ensure the implementation of OHS issues at the camp, construction work sites; • Screening of labourers to be engaged in construction works for health and to be treated adequately before the issue of work permits. • Regular training program for workers on OHS (monthly training and daily toolbox talks) including knowledge of how to deal with emergencies. • Providing Personal Protective Equipment (PPE) for workers, such as life jackets, safety boots, helmets, masks, gloves, body harnesses, protective clothing, goggles, fully face eye shields and ear protection. All workers must wear appropriate PPE at all times when on work/ site. • First aid facilities will be made available at the worksites and in the camps. • Provide firefighting, medical and rescue facilities at the site as a part of an emergency response plan. • Periodic health check-ups of construction workers. • Conduct regular safety audits on safety measures adopted during construction. • Insure all the labour against OHS risks until completion of work. • Adequate water supply and mobile toilets, medical and first aid care facilities at the worksite. • A sufficient supply of potable water should be ensured for all workers and employees onsite. • Awareness-raising material will be used, including posters, signage, booklets, and others at the worksites. • Establish a Grievance Redressal Mechanism to receive the complaints from the workers.
2	Health Management – Communicable Diseases	• Vector borne diseases at workplace and labour camps.	• Carry out disinfection of the labour camps to control the vector borne diseases(spraying of anti- mosquito breeding pesticides in the nearby water bodies) • Provide safe drinking water at work site and in labour camps;.

No.	E&S Aspects	E&S Risks	Mitigation/ Management Measures
			• Use Community Health Centres and PHC in vicinity to address the communicable diseases; • Special Measures for COVID 19 (in case of recurrence) - Sanitizing the workplace and labour camp twice a week. - Providing hand sanitizer or soap facility, masks to labours; - Thermal scanning of each individual should be done every day. - Oximeters should also be used to know the oxygen level of individuals. - Provision of isolation rooms with all facilities; - In case of high temperature or low oxygen level and other symptoms of COVID 19, the person should be immediately isolated from the group, and his contact history should also be recorded. An immediate COVID-19 test should be done from a locally available health facility, and the test should also be done for those who are in the contact history of the subject. - As far as possible, at least 6 feet of social distancing should be maintained in the workplace.
3	Labour Influx	• Pressure on local infrastructure (water, sanitation and health); • Increase in rent and cost of living; • Conflict local community and migrant workers; • Cultural clashes; • Increased SEA/ SH risks.	• Source most of the labours from adjoining areas, and minimize migrant workers; • Construct the labour away from the local settlements; • Implement Code of Conduct for the project workers; • Promote awareness amongst the construction workers on respecting the local communities; • Conduct regular awareness campaigns related to health; • Implement SEA/ SH Action Plan; • Protect the local water resources from pollution due to wastewater discharge form labour camps; • Provide adequate fuel to the labours and protect trees from cutting by the labours in the project area
ESS 3			
4	Generation of Spoils/ Debris	• Uncontrolled dumping on agriculture land; • Blocking of nature drains, stagnation of water, mosquito breeding; • Poor aesthetics; • Nuisance to nearby residents;	• Estimate the quantities of generation of spoils and construction debris and prepare a systematic disposal plan; Dumping sites should be away from water bodies and settlements; • Stack the topsoil separately and use it for plantations, grass turfing; • Explore the opportunities for recycling and reuse, to the extent possible for backfilling/ embankments, filling the low-lying areas, borrow areas, mines; • Monitor the disposal at pre-identified designated places only; • Dumped debris to be levelled and compacted;

No.	E&S Aspects	E&S Risks	Mitigation/ Management Measures
			• Cover the trucks, transporting the debris to avoid dust pollution.
5	Impacts on Borrow Areas	• Permanent loss of agriculture land; • Stagnation of water and vector borne diseases; • Disputes with landowners; • Risk of accidents of livestock and human being due to deep excavation.	• At first instance make use of excavated material and minimise material requirement rom borrow area; • Use crushed sand and Minimise borrowing natural sand; • Use only the sites approved by the PIU for borrowing soil, murum, stone; • The river sand will be sourced away from the active river channels and during the low flow; • The Contractor will identify suitable sites and develop borrow area procurement, and the management plan will submit it for approval of PMU; • Reuse of excavated material from the construction sites to the extent feasible; • Although the material is widely available, the borrowing/mining activities will be limited to fewer areas to reduce the area extent affected by borrowing activities. If any mining activities are to be carried out outside the project area, they should not be located in any sensitive areas; • Borrow sites will be excavated with proper side slopes so as not to cause any sudden fall of people/livestock into the pits, particularly during rainy seasons and floods;
6	Generation of Hazardous Waste (used oil, oily cotton rags, chemical containers, contaminated soil, bituminous waste, asbestos containing materials, batteries, sludge or silt containing heavy metals)	• Open dumping damages soil fertility; • Contamination of water bodies; • Toxic impact on aquatic life; • Contamination of nearby borewells; • Slip and fall accidents; • Fire and explosion risks.	• Before commencing the construction activities, a Waste Management Plan, including hazardous waste management plan shall be prepared and approved by the PIU; The plan will cover written records of - managing hazardous material use, type, amount, storage, transport, and final disposal of all types by type of waste. • In general, the management of hazardous and other wastes, shall follow the following steps, namely: a. prevention; b. minimization; c. reuse, d. recycling; e. recovery, utilisation including co-processing; f. safe disposal. • Store fuels, oils, lubricants and chemicals in contained facilities and take appropriate measures to avoid its spillage on soil; • Cleanup oil spills using spill kits, immediately after such accidental spillage and dispose of contaminated soils, as a hazardous waste; • Deposit the excavated material only at the specified site without disturbing the natural drainage. • Oil interceptors need to be installed at the construction site.

No.	E&S Aspects	E&S Risks	Mitigation/ Management Measures
			• Oil & fuel spills from construction equipment and improper construction site management could result in soil contamination. The contract should strictly enforce the Guidelines of "Hazardous waste (management and handling) rules, 2016. • The sludge or silt accumulated in the urban drains should be tested for heavy metals and if the presence of heavy metals are observed to be more than the threshold limits specified in Schedule II of Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016 adopted by MPCB, then it should be managed as per the provisions in the Rules. • The Contractor will place containers of adequate size and numbers in place to collect various types of wastes (metal, rubbers, used fuels, batteries, etc.) from the worksites and regularly transport these wastes to a centralized facility. • Procurement of services of a waste management contractor for transport and treatment of recyclable and hazardous waste • The empty containers will be returned to the suppliers. • Storage of chemicals 100 meters away from any water sources.
7	Generation of Solid Waste	Adverse health and safety impacts due to indiscriminate disposal of solid wastes.	• Collection and segregation of solid waste into kitchen waste (organics), paper, glass and plastic (recyclable) and inert (non-recyclable). Three kinds of waste bins (with different colours) with adequate numbers and capacities will be placed at the campsite (kitchen, offices, and rooms) to segregate the waste at the source. • Organic waste will be treated through onsite composting or through the use of in-vessel composters • Procure the services of waste management contractors for collecting and managing recyclable waste. • Local municipal waste disposal sites will be used to dispose of inert and garbage. No disposal sites will be established by the Contractor.
8	Generation of dust due to construction activities	• Air pollution; • Increased ambient PM level; • Respiratory problems; • Reduced visibility; • Crop damage;	• Transporting of loose earth, sand and other construction materials with tarpaulin cover during the construction stage. • Dust generation from construction sites would be restricted as much as possible, and water sprinkling would be carried out throughout the construction period. • Frequent sprinkling of water on the local roads and worksites to control dust emissions. The Contractor has to mobilize adequate water sprinkling trucks. • Stabilizing stockpiles; • Paved internal roads; • A GRM will be put in place to receive and address complaints from the public on various aspects of environmental issues, including dust pollution.

No.	E&S Aspects	E&S Risks	Mitigation/ Management Measures
9	GHG Emissions due to construction equipment	• Air pollution; • Respiratory problems; • Smog formation; • Carbon footprint; Global warming;	• Regular pollution checks for construction vehicles shall be made. • All vehicles, equipment and machinery used for construction will be regularly maintained to ensure that pollution emission levels are below the prescribed CPCB standards/ state motor vehicle rules. • Avoid idling of vehicles; • Use of low Sulphur fuel; • Use of electric equipment wherever feasible; • DG set to be provided with a vertical opening chimney of adequate height as per CPCB guidelines. • LPG shall be used as fuel for cooking food at construction labour camps instead of fuel wood.
10	Generation of noise from vehicles, batching plants and equipment	• Hearing loss due to prolonged exposure; • Sleep disturbance; • Headache and fatigue; • Reduced concentration and productivity; • Reduced quality of life in residential areas; • Disturbance to schools and hospitals; • Disturbance to wildlife;	• Construction operations should be undertaken primarily during daytime, i.e., 6:00 am-6:00 pm; • The equipment used in construction shall strictly conform to the MoEF&CC /CPCB noise standards and shall have the latest noise suppression mountings; • Use of Pneumatic tools for hard rock excavation to avoid blasting when the site is within 10km radius from eco-sensitive zones; • No construction vehicle movement during school opening and closing hours and during examination hours. • Traffic guides to be employed near schools; • Noise level monitoring shall be carried out during the daytime near the construction sites, near the sensitive receptors and on the material transportation routes as per the monitoring schedule and results will be submitted to Environmental Manager. In case there is an increase in noise level, preventive measures should be taken to reduce the noise level. • Hearing Protection devices (earplugs or earmuffs) should be provided to workers exposed to noise. • The DG sets and other construction equipment and machinery, as far as practicable, should be fitted with acoustic enclosures to control the noise levels from these sources. • A GRM will be put in place to receive complaints from the public on various aspects of environmental issues, including noise pollution. These grievances will be addressed by adopting the necessary measures.
11	Additional Water requirement for project	• Over extraction; • Exploitation of groundwater;	• During construction, only a permitted quantity of water from approved sources should be used in construction activity. (Resource Efficiency)

No.	E&S Aspects	E&S Risks	Mitigation/ Management Measures
		• Reduction in water availability for drinking and household use.	• Contractor to ensure optimum use of water; discourage labour from wastage of water. • Prior written permission from authorities for the use of water for construction activity should be submitted to PIU. • As far as possible, use treated water for construction works. • Any drilling of tube wells and wells will need permissions from CGWA, and extraction needs to be monitored. •
12	Wastewater discharges from construction sites, worker camps and garages	• Contamination of soil & nearby water bodies; • Pollution of community water sources; • Higher risk of vector-borne diseases due to stagnant wastewater & unhygienic condition;	• Construction of wastewater treatment facilities at the campsite (e.g., septic tank and soak pit), site drainage and oil-grease separators will be provided for the drainage of vehicle washing and service area. • The Contractor will be required to take appropriate measures to avoid and contain any spillage and pollution of the water • All the debris resulting from construction activities shall be removed from the site and disposed of at approved sites on a regular basis to prevent them from getting into surface runoff. • The storage area shall be kept away from the water bodies to prevent any wash away into water bodies and infiltration into the groundwater. • Adequate sanitation and waste management facility to be provided in the construction camp. • Labour camps are to be located away from water bodies. • Construction labours should be restricted from polluting the water sources or misusing the sources.
ESS 4			
13	GBV-SEAH Risks	GBV-SEAH risks may arise due to labour influx	• Include GBV/SEAH obligations in all employment contracts and ensure every worker signs and understands the Code of Conduct (CoC); • Mention in the works contract, the GBV/SEAH obligations of the contractor; • Conduct regular GBV/SEAH awareness and training for PIU staff, contractors, supervision engineers, workers, and service providers; • Display the CoC in local language, at all worksites, labour camps, and community areas; • Raise community and worker awareness on prohibited behaviours, signs of SEAH, and safe reporting practices; • Provide clear information on how to use the GRM for GBV/SEAH complaints, including anonymous and confidential reporting;

No.	E&S Aspects	E&S Risks	Mitigation/ Management Measures
			• Activate the GBV Grievance Redress Committee on any complaint; investigate within 5 days and act within 24 hours, as per the recommendations of the committee; • Pprioritise local hiring; • Ensure labour camps are located away from settlements and maintain updated records of workers and families living in camps.
14	Community Health and Safety	• Increased risk of accidents and injuries to local community especially to children and senior citizens;	• Traffic Management Plan; • Speed limits and designated haul routes; • Warning signage, reflective barricading, trained flagman, light signals; • Driver training and frequent vehicle fitness checks; • Community awareness on Road Safety; • Barricade all construction areas with hard fencing and restrict public entry into risk zones (excavation, heavy equipment, blasting areas); • Install temporary speed bumps near sensitive locations (schools, markets, religious places, habitations; • Ensure proper lighting on roads; • No construction vehicle movement during school opening and closing hours and during examination hours. • Traffic guides to be employed near schools;
		• Fall in trenches made during construction;	• Fencing and access control, proper signage, and reflective barricades; • Cover the trenches at crossings; • Security person at high-risk locations.
		• Accidents due to blasting; • Damages to properties due to vibrations of blasting;	• Conduct the controlled blasting; • Avoid blasting near settlements and deploy hard rock excavation by pneumatic tools.
		• Respiratory issues due to emission and construction dust;	• Regular pollution checks of construction vehicles and equipment maintenance; • All vehicles, equipment and machinery used for construction will be regularly maintained to ensure that pollution emission levels are below the prescribed CPCB standards/ state motor vehicle rules; • Avoid idling of vehicles; • Use of low Sulphur fuel; • Use of electric equipment wherever feasible; • DG set to be provided with a vertical opening chimney of adequate height as per CPCB guidelines. • LPG shall be used as fuel for cooking food at construction labour camps instead of fuel wood.

No.	E&S Aspects	E&S Risks	Mitigation/ Management Measures
			• Transporting of loose earth, sand, and other construction materials with tarpaulin cover; • Frequent sprinkling of water on the local roads and worksites to control dust emissions. The Contractor has to mobilize adequate water sprinkling trucks. •
		• Sleep disturbance and other noise related impacts;	• Construction operations should be undertaken primarily during daytime, i.e., 6:00 am-6:00 pm; • Monitor noise levels; • Advance notice to community for high-noise activities; • The equipment used in construction shall strictly conform to the MoEF&CC /CPCB noise standards and shall have the latest noise suppression mountings; • The DG sets and other construction equipment and machinery, as far as practicable, should be fitted with acoustic, enclosures to control the noise levels from these sources.
		• Contamination of drinking water sources due to construction activities and disposal of labour camp sewage without proper treatment;	• Labour camps are to be located away from water bodies. • Construction labours should be restricted from polluting the water sources or misusing the sources. • Campsite wastewater treatment facility (e.g., septic tank and soak pit) should be made mandatory by necessary provision in the contract; In no case, untreated wastewater should not flow into natural drains; • Oil-grease separators will be provided for the vehicle washing and service area; • The Contractor will be required to take appropriate measures to avoid and contain any spillage and pollution of the water • All the debris resulting from construction activities shall be removed from the site and disposed of at approved sites, on a regular basis, to prevent them from getting into surface runoff. • The storage area shall be kept away from the water bodies to prevent any wash away into water bodies and infiltration into the groundwater.
		• Mosquito breeding due to stagnation of water.	• Fill low lying depressions and borrow areas; • Regular dewatering the pits; • Proper grading and slopes, to prevent water stagnation; • Use larvicides in unavoidable stagnant water;
		• **Provide GRM in place to receive and address complaints from the public on various aspects related to community health and safety.**	
15	Damages to properties and utility services during construction works	• Cracks in structures or damage due to construction works	• Avoid the blasting activities in vicinity of the properties; and carry out excavation by pneumatic tools;

No.	E&S Aspects	E&S Risks	Mitigation/ Management Measures
		• Disruption in services; • Disruption to access of houses and shops to roads	• Restrict the vibrations due to construction activities within permissible limits(<10 ppv); • Cracks or any damages to the properties shall be repaired by the contractor to the satisfaction of the owner or pay compensation; • Whenever utility services such as water lines / gas pipelines / telephone cables / Wi-Fi cable, etc. are expected to be disturbed, prior alternative arrangements shall be made; • In case, the disruption of services is unavoidable, advance notice should be given; such disruptions should be restricted to very short duration and should be restored immediately • Disruption to access from houses and shops to roads: The contractor will make alternative arrangements for access to residences and businesses. • Continuous Community Participation and consultations by contractor.
16	Road closure	• Disruption of traffic; • Traffic congestion; • Increased risk of accidents;	• Whenever, closure of road is unavoidable for conducting civil works, advance intimation should be given to the citizens along with information of alternative routes; • Install proper road signage, barriers, and trained flag persons at all required locations to guide road users safely; • Coordinate with local police for traffic control in high-risk and congested zones; • Maintain diversions/detours in good condition, especially during monsoon; • Ensure places of worship remain accessible and are not blocked or closed during prayer times; • Control dust along temporary diversions through regular water sprinkling to maintain safe visibility and road conditions;
17	Employment Opportunities to local community	• Non-compliance with LMP;	• Implement labour management procedures (LMP); • Encourage to engage local labour with the same terms and conditions as outside workers; • Each Contractor needs to establish a GRM for labour and community-related grievances; • Prohibition of child labour. Persons below the age of 18 are not employed; • No engagement of forced and bonded labour; • Provision of a safe and healthy working environment for labour; • Taking steps to prevent accidents, injury, and disease and appropriate treatment for those suffering from occupational injuries/diseases; and encourage insurance facilities for labour.
ESS 8			

No.	E&S Aspects	E&S Risks	Mitigation/ Management Measures
18	Cultural Heritage	• Physical damage to heritage structures; • Visual intrusion reducing aesthetic value of heritage structure; • Loss of cultural identity and practices;	• Conduct cultural heritage screening and mapping during the planning stage; • Avoid heritage sites through alignment changes or redesign; • Train the workers on cultural sensitivity and respectful behaviour; • Prohibit use of cultural sites for camps, storage or waste disposal; • Assign E&S officer for monitoring heritage safeguards; • Prohibit blasting if culturable heritage sites are in vicinity; • Restrict the vibrations within safe limit (<10 ppv) and monitor vibrations throughout construction; • Repair minor structural damages if occurred unknowingly, under expert supervision; • When avoidance is not possible, obtain clearance from Archaeology and Heritage authorities, if required, before shifting the heritage structure; • Prior consultation with community should be done before shifting any structure having cultural or religious value; and efforts to be made to enhance the cultural value;
19	Chance Finds	• Accidental destruction of artefacts, fossils, pottery or human remains; • Theft, vandalism, illegal trafficking of discovered items; • Loss of scientific and cultural value.	• Develop and include formal Chance Find Procedures (CFP); • Immediate stoppage of work upon discovery of Artefacts / remains (fossils ,coins, pottery or human remains, articles of value and their remains of geologic or archaeological interest); • All the discovered material onsite shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation. • Secure and cordon off the area; • Inform competent authorities (i.e. Archaeology Department); • Resume work only after official clearance and documentation.