

Final Report

EA & EMF for RWSS sector in 28 Districts of Eastern Uttar Pradesh

June 2013
State Water and Sanitation Mission

Mott MacDonald

Executive Summary

The Government of India (GoI) had approached World Bank (WB) for assistance on a National Project on Rural Water Supply and Sanitation for Uttar Pradesh. The project is to bring about positive health and environmental benefits through supply of 'safe' drinking water and creation of sanitary conditions in the villages of Eastern UP. The project will have programmes related to improved water quality monitoring, health and hygiene education as well as ground water recharge for water supply source protection. Environmental mitigation measures will also be included in the project design stage. Uttar Pradesh has constraints in institutional and technical capacity at state, district block and Gram Panchayat levels for implementing sustainable rural water supply schemes and sanitation facilities, as observed from the implementation of NRDWP programme in the state. Hence, Rural Water Supply and Sanitation (RWSS) is proposed to be undertaken as a separate component under NRDWP focusing on Uttar Pradesh with different funding pattern but implemented within the framework of NRDWP. With this background, the state proposed the Rural Water Supply and Sanitation Project with assistance of the World Bank.

To contribute to the environmental sustainability of the project, an 'Environmental Assessment' (EA) Study is required to be prepared as per the World Bank's safeguards policies. For this purpose State Water and Sanitation Mission has appointed Mott MacDonald Pvt Ltd for preparation of "Environmental Assessment and Environmental Management Framework Report for 28 districts of Eastern Uttar Pradesh".

The proposed Rural Water Supply and Sanitation project falls under environmental category 'B' as per World Bank's safeguard policies laid down in OP 4.01 on EA, as the potential impacts due to the rural water supply and sanitation project do not involve environmentally sensitive areas, site specific and negative impacts can be reversed with adoption of proper preventive measures like recharge of ground water with various recharge structures and afforestation measures built into the water supply scheme scope and proper disposal of wastewater from sanitation facilities. The OP 4.01 requires the borrower to screen projects upstream in the project cycle for potential impacts. Thereafter, an appropriate Environmental Assessment (EA) to assess, minimize and mitigate potentially adverse impacts is selected depending on nature and scale of project. The project interventions will be at all four levels: National, State, Districts, and Village (including blocks, as appropriate). As agreed with MoDWS, while the capacity building component will address the National and the State RWSS programs, the demonstration projects for decentralized services delivery arrangements will be implemented over a six year period. Especially designed *disbursement linked indicators* could be used to disburse against the achievement of specific implementation/ output /outcome indicators.

Major Components of the Environmental Assessment Study

The proposed water supply and sanitation project is to provide good water quality and better hygienic conditions in the rural areas of 28 districts of the eastern Uttar Pradesh. For the environmental impacts from the project, environmental monitoring and supervision will be undertaken based on the key environmental issues associated with such type of work.

The assignment will provide the client with clear understanding of the prevailing and expected environmental issues and their probable causes, which have to be considered while preparing and implementing the RWSS schemes. Environmental codes of practices will be prepared; which need to be followed during various stages such as planning, design, construction and operation and maintenance of the proposed RWSS schemes.

The Environment Management Framework will provide the client, with well-defined performance indicators for addressing the identified issues, through the various activities/task under the proposed project, and strategy for its implementation to achieve sustainable sources for water supply and sanitation benefits within the proposed project districts. The following specific components would contribute to the above stated objectives:

- Identification and assessment of the critical environmental concerns in the RWSS sector and address them as an integral part of the project design, execution and operations.
- Identification of generic environmental issues that are beyond the scope of RWSS schemes, but related to the sector and recommend remedial measures to address them as part of the project.
- Identification of household and environmental sanitation issues as well as to make an assessment of pollution level with regard to water supply and its usages and propose appropriate technology options.
- Preparation of (EA / EMF) Report including well-defined performance indicators for addressing the identified issues, through the various activities / tasks under the proposed project.

M/s. ***Mott MacDonald Pvt. Ltd.*** has been assigned the Environmental Analysis (EA) study, with a view to identify the critical environmental concerns in the RWSS sector and to put forth a mechanism to address these issues, through an Environmental Management Framework (EMF).

As per the discussion with SWSM, four representative districts were selected out of the 28 Eastern UP districts to be included in the proposed project. Three villages were selected from each of the four representative districts (Bahraich, Gorakhpur, Ballia and Sonbhadra). The field visit included analysis of the existing scenario with the water supply and sanitation schemes at the village level. Focus Group Discussions were held with villagers in order to identify the problems and needs of the people. The same has been elaborated within section 8.0 of this report.

This Draft Final Report is developed in conjunction with the Draft Environmental Assessment report describing the existing water supply and sanitation practices within the project area districts. A standard Environmental Management Framework has been included within this report with regard to the Draft Environmental Assessment Report.

In order to ensure that the environmental issues are systematically identified and addressed in the various stages of the implementation of the schemes, an Environment Management Framework (EMF) has been developed for this project. The specific objectives of the EMF are as under:

- To design a set of procedures, delineate the roles and responsibilities of various Stakeholders, and institutional structure in the implementation of sub projects along with the capacity building and staffing requirements for mainstreaming environmental management in project implementation processes
- To identify appropriate mitigation measures for addressing the identified environmental issues.

Policy, Legal and Administrative Framework

The State adopts the national policy on water and sanitation which emphasizes participation by the PRIs. It lays emphasis on integration of water supply and environmental sanitation including personal hygiene. The State Water Policy accords high priority for drinking water and underscores the need for regular programme of monitoring of fresh water bodies for protecting their water resource potential.

The proposed project will address all the issues of concern as laid down in the OD 4.01 of World Bank on EA/EMF. Though there are no specific clearances required from the Ministry of Environment, GOI, all the provisions in the various Central and State Acts listed in the chapter 2 to relevant in the context of the proposed project would be incorporated during the implementation of the project.

World Bank Safeguard Policies

The below table describes the relevant safe guard policies of the World Bank and discusses their applicability to the project.

Policy	Applicability to this project
OP/BP 4.01 Environmental Assessment	**Applicable to this project.** The EMF includes a detailed description of assessment procedures for each of the activities proposed under the project.
OP/BP 4.04 Natural Habitats	Not applicable, Since schemes to be taken up under the project would not convert or degrade natural habitats.
OP/BP 4.36 Forestry	**Applicable to the project.** Some of the schemes taken up under the Project will be located in forest areas. Assessment procedures and mitigation measures have been put into place through the EMP in accordance with the approval of the Forest Department and guidelines for compensatory afforestation.
OP 4.09 Pest Management	Not Applicable. Vector control measures, if undertaken in the project will be in accordance with the OP 4.09 avoiding use of insecticides in classes 1a, 1b and 2.
OP/BP 4.12 Involuntary Resettlement	Not Applicable The project will ensure that people are not displaced.
OP/BP 4.20 Indigenous Peoples	**Applicable to the project.** To be decided based on the Social Assessment Study.
OP/BP 4.11 Physical Cultural Resources	Not Applicable to the project. No existing cultural property will be damaged.
OP/BP 4.37 Safety of Dams	Not applicable Since the project does not involve construction of dams.
OP/BP 7.50 Projects on International Waterways	**Applicable to the project.** In accordance with OP 7.50 (International Waterways) this is seen that the proposed project falls within the exceptions to the notification requirement under para 7(a) of the Policy. OP 7.50 is applicable for the proposed project since the Ganga and its tributaries from where water resource would be used for the project is infinitesimally small fraction of overall volume of flow in these rivers and investment components involve piped water supply schemes which will ultimately improve the efficiency of water supply system, delivery of resource, decrease in wastage of resource and thus improved efficiency of WSS system and service delivery. It is envisaged that there will not be any adverse impacts on water quality and quantity due to this project and the other riparian countries will not be adversely affected by the use of water. The project is expected to have a net positive effect on the environment.
OP/BP 7.60 Projects in Disputed Areas	Not applicable As no project components will be proposed in disputed areas.

Environmental Analysis

This will cover the overview of the physical geography of the state, with special emphasis on water resources and sanitation amenities. This environmental baseline has been developed mainly on the basis of data collected through secondary sources, and has been supplemented by village level surveys and Focus Group Discussions in villages of the 4 representative districts. The physical, land use pattern, agriculture status, water resources environment are presented in the section 3 for the study area whereas issues pertaining to the existing conditions on water supply, sanitation, health and hygiene are briefly discussed in the same chapter according to the secondary data collected and findings of the primary field visits.

Major topics covered in this study are:

- Brief Profile of State
- Physical Environment (Temperature & Precipitation, Climate change, Location)
- Drainage pattern (River system, Catchment/Watersheds Delineations)
- Geomorphology
- Hydrology (Surface water, Ground water, Wetlands)
- Disasters (Earthquake, Floods, Droughts)
- Mineral resources
- Quarrying & Mining
- Demographic data
- Land use pattern
- Forests, Agriculture & Horticulture
- Development Activities

Baseline Environmental Status

Water Supply

Surface Water

- Of the rivers and canals in the country, Uttar Pradesh occupies the first place with the total length of rivers and canals as 31.2 thousand km. that is about 17 percent of the total length of rivers and canals in the country. The state of UP falls in Ganga Basin with the sub basins of Yamuna, Ramganga, Gomati and Ghaghra Rivers. The state is estimated to have 161.70 BCM (131.0 m.a.f.) of surface water.

Groundwater

- Among the States, the highest potential of ground water is in Uttar Pradesh with about 72 BCM (58.4 m.a.f.) exploitable ground water resource. The total replenishable groundwater is 84 BCM or 68.1 m.a.f.). The Annual Ground Water Draft is 48.78 BCM and stage of ground water development is about 70%.

Identified blocks – Ground water stressed

Problem	In UP	In Eastern UP
Over Exploited	37 Blocks	7
Critical	13 Blocks	13
Semi- critical	88 Blocks	44
Availability of Ground Water User Maps	70 districts	
Artificial Recharge to Ground Water (AR)	Area identified for AR: 45180 sq km Quantity of Surface Water Recharged: 14022 MCM Feasible AR structures: 4410 percolation tanks, 12600 cement plugs (check dams), 212700 recharge shafts, RTRWH structures (10 lakhs)	

Source: Central Ground Water Board

Surface Water Quality

The water quality in the main rivers is generally deteriorated due to discharge of industrial pollutants as well as other human excreta (especially in the river Ganga and Yamuna due to divine belief of local people), except in the upper reaches of rivers where the pollutant load is minimal.

The quality problems with respect to surface water sources are more acute in the locations and during the periods when the flow in the river is not sufficient to cause acceptable dilution of the discharged effluents.

Central Pollution Control Board (CPCB) classifies river water quality in five classes according to fitness. The standards for these classes have been specified on the basis of chemical and biological parameters, The classification with regard to quality of drinking water sources with and without conventional treatment are indicated as below.

Classification	Class	Tolerance Limit
Drinking Water Source without conventional treatment but after disinfections	A	Total Coliform Organism MPN/100 ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical oxygen demand 5 days 20o C 2mg/l or less
Drinking Water source after conventional treatment and disinfections	C	Total Coliforms Organism MPN/100 ml shall be 5000 or less pH between 6.5 and 8.5 Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20oC 3mg/l or less

Ground Water Quality

Major groundwater quality parameters relevant to domestic water supply need in Uttar Pradesh are Arsenic, Fluoride, Iron, and Total Dissolved Solids (TDS). The Shallow groundwater in eastern districts of the state is naturally found to be in high state of Arsenic, Fluoride, and Iron, leading to the concentrations that are often exceeding the drinking water standards. The districts where aquifers are adversely affected with Arsenic, Fluorides and other undesirable parameters problems include Ballia, Bahraich whereas certain pockets of Gorakhpur, Sonbhadra and other districts are also affected adversely by such water quality problems.

Status of Water Schemes

About 30% schemes are piped water supply schemes. The piped water supply schemes constitute a deep bore well/tube well source with a submersible pump, Over Head Tank (OHT) and a piped distribution system with public stand posts in the villages. A chlorination unit is connected to the pumping main for the disinfection of water. The water, after being chlorinated, is pumped to the overhead tank where it is stored and subsequently supplied to the users through the distribution network. The remaining 70% schemes are hand pump-based. Water treatment is provided by means of hand pump based contaminant removal units like Arsenic, Fluoride removal units.

Coverage status

As on 01.04.2012, the state of UP has a total of 260110 habitations, out of which, the population of 13838 habitations are covered by more than 75% to 99% and the population of 245390 habitations are covered by more than 100%, leaving a balance of 882 quality affected habitations, which need to be covered.

Current Water Treatment Practices

A chlorination unit is connected to the pumping main for the disinfection of water in the piped water supply scheme. After being chlorinated, it is stored and subsequently supplied to the users through the

distribution network. The quality of supplied water is periodically monitored for residual chlorine by the operator. Water quality testing is done by the UPJN at the district/block level testing laboratories.

i. Hand Pump based Treatment
ii. Piped Water Supply Schemes - Chlorination

Sanitation Status:

Health:

It is observed that due to lack of environmental sanitation in the villages, diseases such as **Japanese Encephalitis (JE)/Acute Encephalitis Syndrome (AES), Malaria, and Gastro-enteritis** are affecting the rural population. The major source of these diseases has been identified as the puddles of stagnant water and wastewater nearby the fields/houses, which are breeding places of mosquitoes.

Uttar Pradesh has a large public sector health infrastructure comprising one ***Super Specialty Institution*** (SGPGI), 7 government ***medical colleges*** & ***hospitals***, 53 ***District Hospitals***, 13 ***Combined Hospitals***, 388 ***Community Health Centres***, 823 ***block PHCs***, 2817 additional ***PHC***s apart from 20521 ***Sub Centres***. Apart from this entire infrastructure in the state, the physical health infrastructure in the State is still much below the country average.

Sanitation Level:

There are no sanitation facilities in most of rural households in eastern Uttar Pradesh. Amongst the ones who have access to a sanitary facility, about 50% have a toilet within their house, 4% households share a toilet with other households while about <2% households use a public toilet. Most village people practice open defecation which not only results in degraded sanitation situation but also is a source of contamination of shallow groundwater. Demand and utility for sanitation facilities in eastern UP is very limited. There is need/requirement for sanitation facilities, but as the rural people in general do not have awareness on the benefits of having sanitation facilities and have traditional mind set of practising open defecation, no demand for these facilities is seen. With the intervention of the RWSS project, there could be triggering of behavioural change, which could lead to demand for household sanitary latrines and environmental sanitation facilities. The Nirmal Bharat Abhiyan program emphasises changing mind set of the people through IEC activities rather than mere creation of assets (Toilets).

Waste Management:

In the rural UP, there is no tradition of waste management and there is no proper disposal of sullage water and solid waste generated. Practice of open defecation is widely prevalent. Due to these environmentally degrading practices, rural population is prone to various water borne diseases.

Field Survey & Study

During kick-off meeting dated on 1st December 2012 with SPMU, it was suggested that three villages from each of the four representative districts has to be included for data collection and field study. It has been decided to consider at least 3 villages each from the selected 4 districts (Bahraich, Gorakhpur, Ballia and Sonbhadra) considered as the representative districts and based on the secondary data collection, proceeded for the preparation of the Environmental Assessment and Environmental Management Framework for the project area (28 districts of Eastern UP).

The village level survey and focused group discussions with villagers carried out during the field visits to the 13 villages in the selected representative districts of Bahraich, Gorakhpur, Ballia and Sonbhadra and key findings observed during these field visits conducted are summarized below indicated the following issues related to Water supply and Sanitation.

Major Findings:

Water Supply

- Awareness towards the quality of drinking water is poor among the general public.
- Bahraich and Ballia districts are majorly affected by Arsenic contamination and awareness on the use of water for drinking from the arsenic removal units (provided UPJN to supply arsenic free water) is of concern.
- Except Sonbhadra and southern parts of the project area, other parts of eastern UP have shallow hand pumps as well as deep hand pumps (installed by UPJN) and coverage in terms of quantity is not a problem. In case of quality problem habitations, the coverage of population with contaminant free drinking water could be different, as some of the plants are not working and people are not using the water from these plants.
- In Sonbhadra, because of the geophysical status, ground water table is deep and shallow hand pumps are non-existent and rural people are generally dependent on the deep Mark-II hand pumps installed by UPJN. The habitations are scattered and sparsely populated and require maintenance free robust technologies for contaminant removal. The major quality problem, in this district is fluoride and iron. In some of the habitations, Hand pump based fluoride removal plants and Iron removal plants are installed by UPJN.

Sanitation:

- Average more than 80% villagers are practicing open defecation.
- Remaining households are having sanitary latrines with soak pits.
- Majority of the latrines which have been constructed under TSC are observed to be not in use.
- Kitchen waste/ is being discharged in the open drains. These are meeting with natural water body present in village like pond resulting source of environmental pollution as well health and hygiene concern.
- In 11 villages visited, proper drains are not constructed resulting in safe disposal away from the village.
- In Gorakhpur, village's water supply pipe network is passing through/running parallel/ very close to these drains, which could be source of contamination of water pollution especially if the pipe line is having leakages.
- In Gorakhpur villages, environmental sanitation is poor (as in other districts), where the JE disease is prevalent, but the virus could be dormant in carriers such as pigs and other animals in these areas, which could break out during rainy season.

Environmental Concerns and Management Proposals:

In order to ensure that the environmental issues are systematically identified and addressed in the various stages of the implementation of the schemes, an Environment Management Framework (EMF) has been developed for this project. This section covers the brief discussion of the following sector and project related key environmental issues, and also sector related other key environmental issues and management proposals.

- Water Quantity
- Water Management
- Ground water quality
- Surface water quality
- Poor Hygiene
- Household sanitation
- Rural Environmental Sanitation
- Solid and liquid waste disposal

The study also includes:

- Management of Large Scale Degradation in Mini-Catchment Areas
- Management of Uncontrolled and Over Grazing in catchment areas
- Management of Fuel Wood Pressure

- Management of Water Quality Issues Management Measures for Source protection and its Sustainability
- Monitoring and Performance tracking of source centred catchment area conservation and Management program
- Fund flow arrangements for implementing works
- Environmental Management Measures

Stakeholders Consultation: World Bank/ GOI funded Rural Drinking Water & Sanitation program dated on 23/01/2013

A stakeholders workshop involving all the SWSM officials, district level development officers, Institutional representatives responsible for providing rural water supply and sanitation facilities (UPJN, Panchayati Raj Department), State Ground Water Department, Health Department, NGOs, PRI representatives and community leaders was conducted on 23/01/2013, to apprise them of the proposed Rural Water Supply and Sanitation Project for Eastern UP being funded by World Bank. In the workshop, the activities being taken up such as Environment Assessment and Environment Management Framework Study, Social Assessment Study, Institutional Arrangements for implementation of the project were informed and presentations were made by the study consultants to put forth the issues identified during their study and present status of their study, to solicit the suggestions and comments from workshop participants for effective identification of measures to be taken up during implementation of the project.

Key issues identified:

- Water quality monitoring should be done on regular basis, as the determination of quality problem based on one time data is not correct.
- Emphasis to be on awareness creation and triggering behavioural change for usage of individual sanitary latrines and its impact on health.
- Unsanitary conditions in the villages need attention and solid and liquid waste management has to be given due importance.
- DWSC to take lead for the implementation of all the sub-projects for the RWSS.
- Single habitation schemes/Multi village schemes and Single village multi habitations schemes to be implemented as a part of RWSS.
- DWSC shall be given full authority and assistance for choosing the support organisation (SOs).
- Water Quality problem & Water scarcity area shall be taken up on priority basis.
- The implementation and O&M responsibility to be taken up by the community.
- Bacteriological contamination and presence of anthrop virus were found to be scaling high, causing death of numerous lives. The major cause of such contamination was envisaged as the practice of open defecation, contaminating the shallow hand pumps.
- Gorakhpur/Basti/Azamgarh/Deoria, were among the worst affected districts from Japanese Encephalitis (JE), and it was envisaged that drinking water and poor sanitation condition are the primary carriers responsible for such deadly disease spreading among the community.

Institutional Arrangements

The personnel and agencies with the responsibility for environmental management will be given in table below.

Level	Institution	Function	Responsibility
State	State water Sanitation Mission (SWSM) in consultation with STA (Already in existence)	Ensure overall implementation of the EMF in the proposed RWSS project. Arrange funds required for implementing the provisions of EMF. Ensure availability of required human resources for implementation of EMF. Ensure that recommendations from supervision and monitoring are integrated into the project and the EMF is updated periodically as necessary. Integrating communication and capacity development programmes for both water supply and sanitation. Recruit external experts for conducting Environmental Audit once in a year and ensure that the relevant recommendations are integrated into the project. Conduct environmental supervision of all Water Supply and Sanitation schemes on a half yearly basis.	ED, supported by State Level Environmental Expert.
	Water and Sanitation Support Organization (WSSO) (Already in existence)	Provide support to the Department of Rural Development in preparing the EDS. Facilitating participation of the community in preparation of EDS as part of the DPR preparation and in certification process (for environmental mitigation measures) for implementation completion report. Deal with software aspect of RWSS sector and may not be involved in implementation of water supply and sanitation schemes; Liaison with forest department, UPPCB, ground water department and other related departments at scheme level for ensuring implementation of identified mitigation measures (permissions, technical support, etc.). Provide support in execution of the HRD and IEC activities on EMF. Provide support to the Department of Rural Development in the supervision, monitoring and audit activities of the EMF. Train the VWSC in conforming to EMF requirements in operation and maintenance of sanitation schemes.	Director of WSSO
District	District Water and Sanitation Mission (DWSM) (Already in existence)	Training and Capacity Building of SOs, VWSC, Block Resource Persons – Environmental Management (BRP-EM) and District Resource Person – Environmental Management (DRP-EM) on EMF. Coordination between various players and actors involved in EMF. Coordinate with other line departments on environment related issues. Formulation, management and monitoring of projects and progress on drinking water security and total sanitation in rural areas.	EE, DWSM supported by the District Level Environmental Experts

Level	Institution	Function	Responsibility
Block	Block Resources Centre	Environmental management and monitoring of RWSS sector projects at the Block level. As part of the scrutiny of the schemes submitted by the GP – will check if environmental screening and appraisal has been properly done before forwarding them to the DWSM. Coordination with NGOs for ensuring integration of EMF in all relevant project activities including capacity development, communication, project management and supervision. Sensitizing the public representatives, officials and the general public about the provisions of the EMF.	Block Resource Coordinator, supported by the DWSM resource personnel
Village	Village Water and Sanitation Committee (VWSC) with the support of Support Organization (SO)	Participation in preparation of Environmental Data Sheet (EDS) to be enclosed to Detailed Project Report (DPR). The committee shall deliberate on environmental safeguards relevant to the schemes and adopt the same during construction and implementation Certifying the implementation of environmental mitigation measures as part of the implementation completion report. Facilitate IEC activities regarding water conservation, sanitation and hygiene among the villagers. Collection of household contributions and user fees, opening and managing a bank account. Preparing annual budgets and recommendations for user fee charges. Responsible for procurement of goods and services, supervising contracts and works and making payments	President (GP), WSSO, JE/ AE (UPJN), PRI personnel

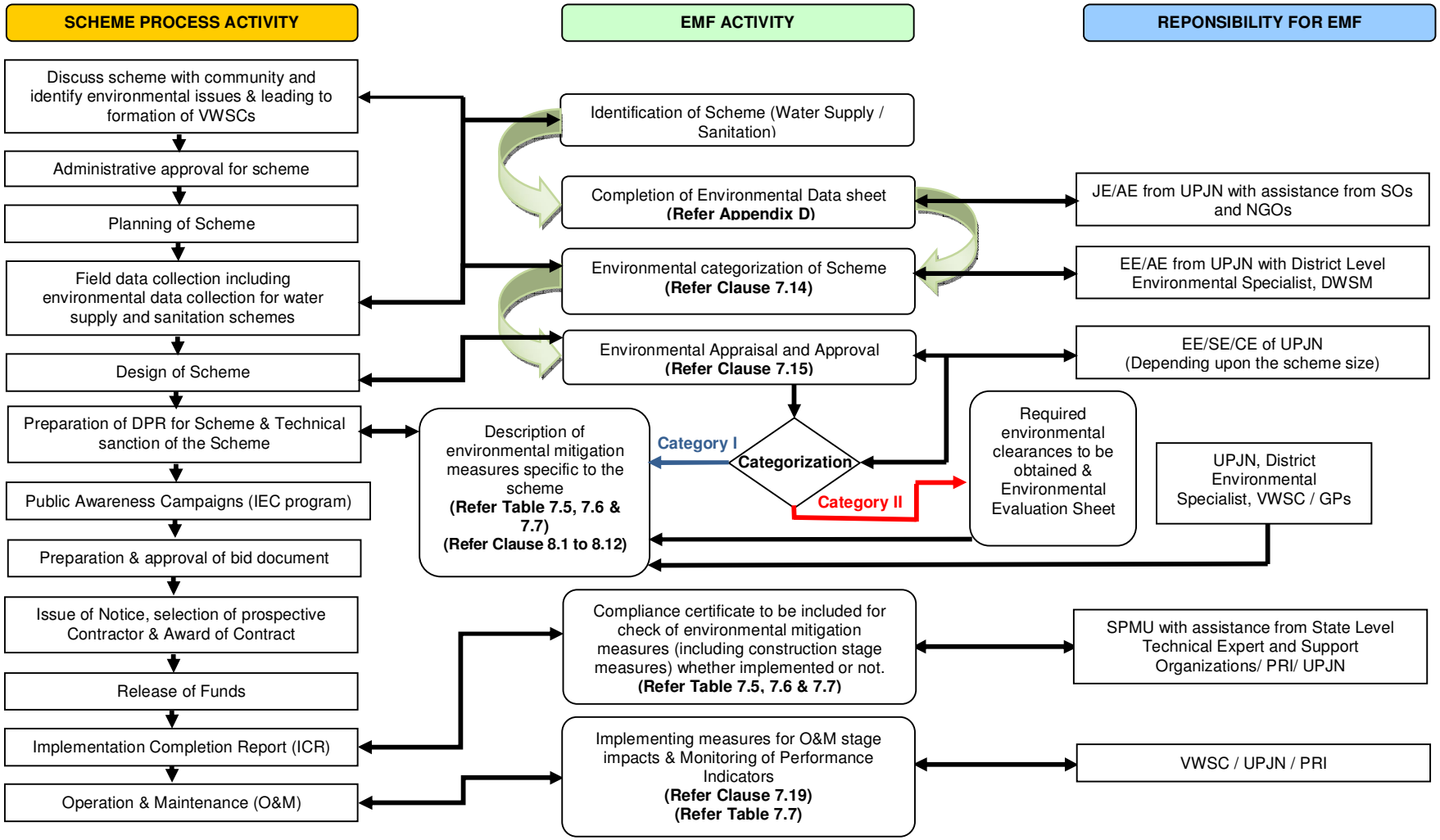
Environmental Management Framework

In order to ensure that the environmental issues are systematically identified and addressed in the various stages of the implementation of the schemes, an Environment Management Framework (EMF) has been developed for this project. EMF activities in the preplanning, planning, implementation and O&M phases of the proposed project cycle for the project sponsored schemes along with the responsibilities are indicated against the respective tasks. The key elements of EMF are as follows:

- Environmental Data Sheet
- Environmental categorization of the scheme
- Environmental appraisal and approval required
- Implementation of Environmental mitigation measures
- Environmental supervision, monitoring, and evaluation
- IEC and capacity building on hygiene and environmental issues

The following environmental frame work flow chart provides the understanding of the EMF activities to be taken up at various stages of the scheme.

EMF Implementation Process throughout a scheme cycle



Screening Guidelines for Environmental Issues

Screening Matrices has been applied to identify category of schemes regarding its environmental impacts and application/clearances of GOI/GoUP Legislative and World Bank Policies on the schemes interventions. Some significant types of schemes and environmental clearance and approval agency for such schemes are given below:-For Drinking water schemes

Activities under schemes

- Land Availability (Forest Land/Community/Private Land)
- Location and Type of source
- Sufficient water available at source (even in summer)
- Testing of water quality of the water source
- Competitive uses of the Water Source
- Preferred water source should be River or Deep Tube Wells

Category I (Low Impact)	Category II (High Impact)
a. WS involving pumping, construction of storage tanks and piped distribution networks, with source as tube well/ bore well. b. WS with source as spring where water will flow by gravity to the distribution network. c. Existing WS requiring rehabilitation. d. Roof water harvesting units, where scattered households cannot be served by piped network. e. Ground water recharge measures.	a. WS with water source requiring special treatment for removal of arsenic, iron, fluoride, and salinity, etc. b. WS with source as river where water will have to be conveyed from long distances. c. WS with source located in/very close to natural habitat/ sensitive ecosystems such as National parks, Wild life sanctuaries (requiring forest permission/clearance) d. WS with water source from highly critical aquifers / over exploited zones. e. WS with water source having significantly competing water demands over irrigation, agriculture and other domestic uses etc.

Refer Appendix D: Format for Environmental Data Sheets (EDS)
D.1 EDS for Water Supply
D.6 EDS for Rain Water Harvesting

For Toilets, Soak Pits, Compost Pits and Garbage Pits

Activities under scheme

- Location of Toilets, Leach pits, Soak pits/septic tanks, compost pit, & garbage pits.
- Type of soil.
- Liquid waste discharge.
- Solid waste collection and disposal

Category I (Low Impact)	Category II (High Impact)
1. Environmental Sanitation	
a. Construction of ISL, Leach Pits where subsurface strata is favourable for adopting toilets, pits and groundwater table is at depth greater than 3.0 m below ground level.	a. Community latrines, Soak pits and disposal of sewage through septic tanks / soak pits where ground water table is less than 3m below ground level. b. Construction of ISL/community latrines/soak pits where subsoil strata is not favourable (hard rock or low infiltration capacity) c. Construction of ISL/community latrines/soak pits in water logged areas.
Refer Appendix D: Format for Environmental Data Sheets (EDS) ***D.2. EDS for Sanitation Schemes*** ***D.3. EDS for Household Soak pits***	
2. Solid Waste Management	
a. Construction of Compost pits, garbage pits where subsurface strata is favourable b. Household biogas plant c. Household vermin-composting plant d. Household aerobic composting plant	a. Community level biogas plant b. Processing unit for recycling plastic waste
Refer Appendix D: Format for Environmental Data Sheets (EDS) ***D.4. EDS for Community Solid Waste Management*** ***D.7 EDS for Wastewater Treatment Systems***	

Risk & Assumptions

The major risk factors along with some proposed management measures from the environmental point of view are given in table below, which are as follows:-

S. No	Environmental Risks	Management Proposals
1	Drying-up of water sources	■ Preventing water wastage ■ Draw out only planned quantity ■ Water augmentation ■ Water harvesting ■ Catchment area treatment ■ Alternative sources be explored
2	Natural Calamities like Flash Floods, Droughts & Earthquakes	■ Sub & Micro-Watershed treatment ■ Reducing dependency on Fuel wood & Fodder extracted from forest area ■ Installation of electrical & mechanical equipment above flood level. ■ Cordoning off the source works with protection walls (wherever possible to do so), prone to floods ■ Establishing diversions within the flood routes in order to protect the source at the downstream.
3	Lack of awareness in the community, especially regarding water quality and environmental sanitation	■ Intensive awareness creation program. ■ Incentives as visit to new/ religious places in the state, distribution of FTKs and ensuring its usages may help. ■ Identify convenient water quality testing centres.
4	Unsuitable location and design of toilets specially twin-pit pour flush toilets	■ Selected site should not pollute the downstream or nearby water supply source. ■ Proper design, construction and maintenance of toilets should be ensured.
5	Absence of Proper waste management in the community	■ Proper training regarding use of compost and garbage pits ■ Incentives to be provided ■ Arranging/ encouraging private garbage collectors to collect sellable/ usable waste periodically, from each village

Capacity Building and Training

The training and capacity building program has been proposed for project, the aiming of this is building environmental awareness and environmental management capacity in the project administration structure as well as in the intended target communities. The training programs for the staff in the project agencies at various levels as well as for the village communities are detailed out in following table.

Capacity Building and Training:

S. No	Training	Purpose of the Training	Participants	Schedule	Course content
1	Introduction to Environmental Management in Proposed RWSS project including EMF	Filling of EDS, procedural & technical aspects of Environmental Assessment. To equip with knowledge and skills necessary for undertaking environmental appraisal as per the requirements of the EMF. To undertake periodic supervision of environmental performance of schemes To prepare for planning and monitoring implementation of environmental mitigation measures identified through the appraisal process. To equip with skills necessary for	Personnel from WSSO, SWSM, UPJN	Orientation Workshop - 1 day in each project district Main & Livener Training Programme – 3 days	Environment aspects pertaining to sustainability of water sources, water quality, protection of sources, Multi-GP schemes, besides sanitation facilities and Environmental appraisal. Water quality monitoring, prevention of pollution & surveillance.

S. No	Training	Purpose of the Training	Participants	Schedule	Course content
		water quality testing using the field testing kits under the Community based System for water quality Monitoring and Surveillance.			
2	Environmental Awareness and Sensitization	To build awareness on safe drinking water, water conservation, judicious use of water sources for competing demands, environmental sanitation and personal hygiene.	Personnel of UPJN, SOs, Members of VWSC and NGOs	One day workshop at the Block level. One day livener workshop organized annually. Total training programs will be about 224 for the project duration.	--
3	Orienting for planning, design and implementation of RWSS schemes including environmental issues/safeguard for PRIs and UPJN	To create awareness among the implementation agencies as well as the monitoring units so as to have in depth understanding of the schemes being implemented under the proposed project. The orientation shall educate the agencies with regards to the environmental issues / safeguard to be taken into consideration during the implementation of the proposed schemes.	Personnel form PRI, UPJN, Members of VWSC and NGOs.	3 day workshop – First day induction program, and next 2 days in detail training with regards to the environmental issues/safeguards.	
4	Orientation for Water Quality monitoring for PRIs	To build awareness on water quality monitoring amongst implementation agencies.	Personnel form PRI, UPJN, Members of VWSC and NGOs.	One day training at the Block level. One day livener Training organized annually. Total training programs will be about 224 for the project duration.	

Key Performance Indicators:

Following key performance indicators were identified as a result from the analysis of the secondary data collected and existing scenario of the water supply and sanitation issues. The detail is as stated in section 7.19.

1) ***Water Quantity,***
2) ***Water Quality,***
3) ***Environmental Sanitation,***
4) ***Institutional Arrangements and Capacity Building.***

Environmental Code of Practices

The details of relevant Environmental Codes of Practices (ECOPs) for following activities are described in the section 8 of this report.

- Identification of Sources of Water Supply
- Protecting Surface Water Supply Source and Ensuring Sustainability
- Protecting Ground Water Supply Sources and in Ensuring Sustainability
- Water Quality Monitoring
- Selection of Safe Sanitation Technique Options (Including Drainage) at Individual Household and Community Level
- Selection of Location for Community Toilets
- Safe Sullage Disposal and Organic Waste Management
- Safe Solid Waste Management at Individual Household and Community Level
- Management of Catchment Area
- Rehabilitation of Construction sites / Supplementary sites
- Schemes in Forest Areas
- Borrow Areas