Proposed Terms of Reference

Project Name : Transfer of Rajasthan share of Yamuna Water at Tajewala Headworks to Churu and Jhunjhunu districts of Rajasthan by Underground Conveyance System

Project Proponent: Water Resources Dept., Govt. of Rajasthan

Project Category: Category-A: 1(c) River & Valley Projects (CCA >50,000 ha) as *per EIA Notification, 2006 & its subsequent amendment dated 14.08.2018*.

1. SCOPE OF EIA STUDY

The broad scope of the work is to carry out Environment Impact Assessment of proposed project, assessment of positive impacts with its economic evaluation and prepare Environmental Management Plan (EMP) to mitigate the adverse effects, including the socio-economic aspects and R&R Plan for project affected people.

2. STUDY AREA

The study area for the project can be considered as:

i. 500 m either side of the pipeline alignment;
ii. 10 km radius around the irrigation command area of the project from the periphery of the project site, submergence area for the reservoir, command area in the downstream of the reservoirs.

3. ENVIRONMENTAL ASSESSMENT METHODOLOGY

Activity	Environmental Assessment Methodology
Activity 1	Study of Policies, Legislation and Administrative Framework
Activity 2	Environmental Screening
Activity 3	Collections and Analysis of Baseline Data
Activity 4	Scoping of Project for Preparation of Environment Assessment Study
Activity 5	Stakeholders Consultation and Public Disclosure
Activity 6	Analysis of Alternatives to the Proposed Project

***Activity* 7**	Assessment of Potential Impacts and Mitigation
***Activity* 8**	Preparation of Environmental Management and Monitoring Program (EMP)
***Activity* 9**	Preparation of Environmental Assessment Report
***Activity* 10**	Statutory Clearances (Environmental, Wildlife and Forest Clearances)

4. ENVIRONMENTAL IMPACT ASSESSMENT

The Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) report will be prepared considering all the relevant notifications issued by Ministry of Environment and Forests (MoEF) or any other competent authority (viz. EIA notification, 2006 and subsequent notifications/amendments issued from time to time) and in accordance to all the relevant guidelines issued by MoEF & CC or any other competent authority.

As outlined in the notification cited above, Public hearing shall be carried out as per the requirements of the fulfillment of EIA notification as a part of consultation with civil society. The EIA study will cover all the relevant environmental issues that have impact due to the proposed project including the following:

5. BASELINE ENVIRONEMNAL DATA:

Baseline Environmental Status of the project shall be established based on the baseline survey carried out for various relevant seasons (either fresh or based on available literature/authenticated documents supplemented by field monitoring) in accordance to the MoEF & CC requirements for all the following elements. The field monitoring span for EIA should be over a period of one year to cover the entire annual cycle accommodating seasonal variations on various parameters.

- Air Environment
- Noise Environment
- Water Environment
- Land Environment
- Biological Environment (Aquatic & Terrestrial Ecology)
- Socioeconomic Environment

i. AIR ENVIRONMENT:

Description of climatological conditions of the site with respect to wind speed & direction, temperature, atmospheric pressure, humidity, solar radiation and rainfall based on secondary data collected from nearest IMD station(s) as well as meteorological observations taken during field studies. Monthly and Annual averages of Pressure, Relative humidity, Solar radiation, Temperature and Rainfall should be presented. Seasonal and Annual wind rose should be prepared (3 seasons). In addition, weather phenomena like hail, thunder storms, fog/smog and cloud cover should be noted in terms of their intensity and duration.

Ambient Air quality parameters & Monitoring Period:

Seasonal Ambient Air Quality Monitoring will be conducted in respect of the following parameters for assessment of the same:

- Particulate matter of size less than 2.5 micron or $PM_{2.5}$
- Particulate matter of size less than 10 micron or PM_{10}
- Sulphur Dioxide (SO_2)
- Oxides of Nitrogen (NO_x)
- Carbon monoxide (CO)

The locations of the ambient air quality monitoring stations in the study area will be selected so as to accord an overall idea of the ambient air quality scenario in the study area.

ii. NOISE ENVIRONMENT:

To assess the background noise levels in the study area ambient noise monitoring will be conducted at suitable locations. The stations will be selected judiciously based on the following considerations:

- Obstruction free exposure of equipment
- Away from temporary noise generating sources to monitor true background levels
- Accessibility of the location during day and night
- Security and safety of the instrument

iii. WATER ENVIRONMENT:

This will cover all the aspects of surface as well as ground water. This shall include but not limited to:

- Ground water quality
- Surface Water Quality (Surface water bodies)
- Ground water regime (ground water table, aquifers)

iv. LAND ENVIRONMENT:

Land use and land cover using high resolution satellite imagery will be studied in the study area for the following factors:

- Habitation Area
- Forest area
- Wasteland
- Agriculture land
- Water body land

v. BIOLOGICAL ENVIRONMENT (AQUATIC & TERRESTRIAL ECOLOGY)

Impact on forest area and National park and wildlife sanctuaries and other sensitive ecosystem and impact on biota and biodiversity losses will be assessed during the study. Following parameter or factor will be studied in the study area:

- Forest cover
- Rare and endangered species
- Species which require management
- Species of economic significance
- Species of special interest to local population or tourists
- Habitat including breeding ground and access corridor for food and shelter
- Aquatic fauna of commercial/recreational value and migratory fish species along with their spawning ground
- Biodiversity

vi. SOCIOECONOMIC ENVIRONMENT

In socio-economic environment following baseline data will be collected on various parameters/factors:

- Archaeological Locations and places of worship
- Sources of water pollution (present as well as future)
- Dependence on water system
- Tourism
- Public Health
- Human settlements (occupational pattern, demographic profile, economic profile, agricultural practices etc.)

6. ENVIRONMENTAL IMPACT ASSESSMENT (EIA) & ENVIRONMENTAL MANAGEMENT PLAN (EMP) and ENVIRONMENTAL MONITORING PLAN

A. ENVIRONMENTAL IMPACT ASSESSMENT (EIA):

Environmental Impact Assessment (EIA) will be carried out for construction and operation phases using qualitative or quantitative methods (wherever possible) and using predictive modeling techniques. EIA should have proper reference for all the facts and figures. In case of Primary data, precise information regarding time, data, place etc. of the observations should be given.

The EIA study shall cover all the relevant environmental issues that have impact due to the proposed project including the following:

- Air & Noise Environment
- Water Environment
- Land Environment
- Biological Environment (Aquatic & Terrestrial Ecology)
- Socioeconomic Environment

i. Air & Noise Environment

- Impact on air quality due to construction

- Changes in microclimate
- SO
- NO_x
- $PM_{2.5}$,
- PM_{10}
- Methane
- CO
- Impact on ambient Noise level specially during construction period

ii. Water Environment

Likely change in the regime of the water in the project area:

- Impact on water quality (surface & ground) including down-stream river/nalah
- Impact on ground water levels and recharge potential.
- Impact on human health, diseases.
- Impact on ground water pollution due to seepage from canal system and reservoir (ground water level and quality)
- Impact on water quality due to influx of labour
- Impact on drainage system upstream near reservoir submergence area
- Impact on existing water bodies downstream as well as upstream in the project area

iii. Land Environment

Impact on land use/land cover and change in designated land-use in the project area i.e. submergence area due to construction of main RWR, Block reservoir, transmission lines etc., and areas under proposed command. The assessment can be done using the GIS tools and satellite imageries of the area However; it will have to be confirmed by ground truthing.

- Impact due to irrigation induced salinity and water logging
- Impact due to inundation of mineral resources
- Impact on soil erosion
- Impact of mining for construction materials
- Impact due to dumping of muck generated from foundation excavation of main RWR and underground pipeline network etc.

iv. Biological Environment (Aquatic & Terrestrial Ecology)

Terrestrial Environment

- Impact on forest area and National park and wildlife sanctuaries and other sensitive ecosystem.
- Impact on biota and biodiversity loss particularly with special reference to the rare and threatened species, endemic species of both animals and plants.
- Impact on habitat loss particularly with special reference to the rare and threatened species, endemic species of both animals and plants.
- Impact due to habitat change having effect like corridor loss and loss of migratory path for wildlife including birds.
- Impacts on the breeding grounds of species and on access of animals to food and shelter.
- Impact on animal distribution
- Impact of loss of species.
- Impact due to loss of ecosystem services being offered by the area.

Aquatic Environment

- Impact on flora and fauna in the takeoff point of Yamuna Canal
- Impact on sensitive ecosystem
- Impact due to bio-accumulation and bio-magnification in aquatic life and biota etc.

v. Socioeconomic Environment

- Impact of loss of common property resources (river, forest, land etc.) on livelihood
- Impact on public health due to vector borne diseases, dam diseases.
- Impact on sensitive locations like archeological sites and places of worship etc.
- Impact on change in occupational pattern
- Impact on tourism
- Impact on human settlement
- Impact on flood moderation & drought mitigation
- Impact of influx of labour

B. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Based on environmental impact assessment, mitigation/ enhancement measures need to be specified in the form of environmental management plan. The components of the EMP will inter-alia deal with the following as may be relevant to specific project site:

- Environmental safeguards (management) during construction activities
- Plan for restoration of quarry areas/borrow areas and areas for dumping excavated material.
- Conservation plan for affected flora/fauna including rehabilitation plan for rare/endangered species including action plan for alternate breeding ground and access corridor for food and shelter.
- Comments/observations/recommendations of Chief Wildlife Warden in case Wildlife

  habitat/migratory path exists within 10 kilometers of project site.
- Action plan for control of irrigation induced water logging, salinity etc including strategies and policies with choice of species/crop for optimum use of water for agriculture to reduce adverse impacts of excessive irrigation including water logging.
- Action plan for command area development in respect of irrigation potential.

C. ENVIRONMENTAL MONITORING PROGRAMME

Environment Monitoring Programme to monitor the mitigation measures implemented at the project site should be prepared. The plan should spell out the aspects required to be monitored, monitoring indicators/ parameters with respect to each aspect and the agency responsible for the monitoring of that particular aspect throughout the project implementation and post project environmental monitoring.

The proponent/ consultant will design a post-project environmental monitoring programme for implementation, and then various parameters will be monitored by relevant departments. The cost estimates and equipment necessary for the

implementation of this programme shall be included. Inclusion of the following indicators in such a programme should be considered:

- Water quality in the main RWR, standard analysis
- Technique including the analysis of toxic residues from agro-chemicals
- Trends in incidence of water related diseases
- Change in soil fertility, structure and texture;
- Changes in ground water level and ground water quality.

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