DRAFT TERMS OF REFERENCE (TOR's)

1. Introduction about the project and its objectives

- Savanur Taluk in Haveri district is considered as one of the backward taluks in the State as per Dr. Nanjundappa Committee Report constituted by Govt. of Karnataka to assess regional imbalances in the state.
- Major occupation of the people of this region agriculture. The annual average rainfall is 475mm to 689 mm, which is primarily during the monsoon season (as per Records of IMD station, Dharwad). There are a few tanks which collect rainwater, which are used to irrigate areas in its surroundings; however the major portion of agricultural land other than the achkat (catchment) of tanks depends upon direct rainfall. Farmers grow semidry crops like maize, pulses, sunflower, groundnut, jowar, etc.
- However monsoons are very erratic and unpredictable and in the past few years have been below normal in the region and its surroundings resulting in crop-losses and poor harvests, thus making the livelihood of the people difficult.
- To minimize the dependence of agriculture on monsoons, Savanur Integrated Micro Irrigation Project has been proposed by the Dept. of Water Resources, Govt. of Karnataka to provide irrigation the villages of Savanur Taluk of Haveri District. This will provide stability to agriculture and thus improving the per capita income and standard of living of the people.
- The scheme envisages diversion of 1.5 TMC (42.47 Mcum) of water from the existing Kalasur barrage across Varada River near Kalasur Village, Savanur Taluk and lifting the water to higher lands and providing irrigation facility to 15,500 ha of lands of Savanur Taluk, Haveri district.
- The entire 15,500 ha command area of Savanur lift irrigation system is divided into 4 zones namely Zone-I (4610 ha), Zone-II (4125 ha), Zone-III (3565 ha) and Zone-IV (3200 ha).
- The total water allocated for the proposed project was 1.5 TMC(42.47 Mcm). Out of which 1.35 TMC (38.22Mcm) of water will be utilized for irrigation purpose by adapting drip irrigation with piped conveyance system and remaining 0.15 TMC (4.25Mcm) of water will be used for filling of existing MI tanks (11 Nos.) in and outside the command area to provide drinking water facility and sub soil replenishment.
- The project does not involve submergence and no forest land is required for the project.

However the Bankapura Peacock Conservation Reserve is at a distance of 3.6 Km from the command area boundary towards west direction hence the project attracts general condition as mentioned in the Environmental Impact Notification -2006 and its subsequent amendments and falls under 'A category'.

- The location of proposed jack well is at longitude 75°23′34″E and latitude 14°53′02″N near Kalasur Village of Savanur Taluk.
- The proposed irrigation is only in Kharif period and the intensity of irrigation is 100%.
- Command area benefited – 30 villages of Savanur Taluk, Haveri District. (Bavinahalli, Gundur, New Gundur, Neeralgi, Savanur, Jallapura, Teggihalli, Kalakoda, Hattimattur, Tallihalli, Yallapura, Hosahalli, Mavuru, Chikkabudihal, Kamal Bangadi Timmapura, Hurulikoppa, Tonduru, Challala, Hale Tondur, Mellagatti, Kalkoti, Hire Mugaduru, Mantgani, Mellagatti-old, Kalsuru, Sirbadgi, Mannangi old, Mannangi, Kurubar Mallur, Nandihalli).

1.2. Filling of Existing MI Tanks

It is proposed to fill the existing minor irrigation tanks coming in and around the command area for providing drinking water facility and sub soil replenishment. It is proposed to fill 10 No.s of tanks in Savanur Taluk and 1 tank in Kundgol Taluk. A provision of 0.15 TMC (4.25 M.Cum) of water is made under this scheme for filling of these tanks. Following Table 1.2 present the list of MI tanks are proposed to be irrigated.

Table 1.2: List of Tanks Proposed for Filling under Each Taluk

Sl.No	Savanur
1	Madapurkere,
2	Yelvigikere,
3	Sirbadgikere,
4	Huralikoppakere,
5	IchalyellapuraHosakere,
6	Hattimotturkere,
7	Kalivalkere,

8	KadkolHosakere,
9	Siddapurkere,
10	Hulagur tank
	Kundgol Taluk
11	RattigeriKere

1.3. Following details will be included in the detailed EIA/EMP study Report:

1.3.1. Study Area

- Entire Command Area (Irrigable Command Area) – 15,000 Ha (Command Areas of Savanur Taluk of Haveri District).

1.3.2. Environmental Monitoring/Baseline study

- Soil Quality sampling stations- 6 locations
- Water Quality sampling stations-7 Locations
- Air Quality Sampling Stations- 5 Locations
- Noise Quality Sampling Stations- 5 Locations

Table 1: Details of proposed soil sampling locations.

Sl. No	Sample Code	Sample location	Latitude	Longitude
1	S1	Kalasur Near Lift point	14°53′02″N	75°23′34″E
2	S2	Kalalkond	14°57′31.25″N	75°22′13.06″E
3	S3	Teggihalli	14°58′5.59″N	75°17′51.31″E
4	S4	Kamal bangadi Timmapur	14°55′32.49″N	75°26′58.91″E
5	S5	Hurlikoppa	14°55′25.41″N	75°20′46.31″E
6	S6	Mannangi	14°52′8.46″N	75°20′34.35″E

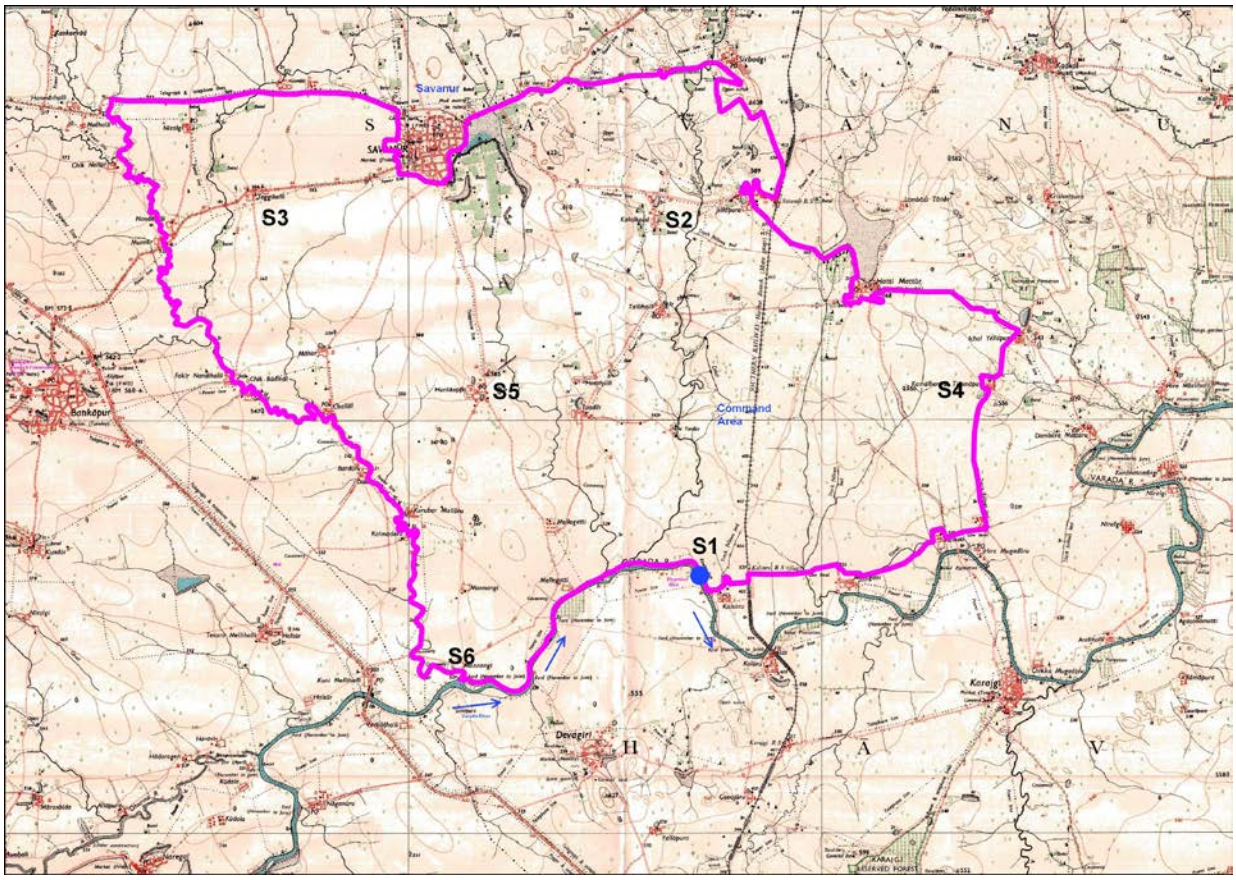

Figure 1 - Proposed Location of Soil Sample Stations on Toposheet

Table 2: Details of proposed water quality sampling stations.

Sl. No	Sample Code	Sample location	Source of Water	Latitude	Longitude
1	SW1	Varada River near Kalasur Village (lift point)	Surface water	14°52′54.26″N	75°23′36.27″E
2	SW2	Mannangi	Ground water	14°52′8.46″N	75°20′34.35″E
3	SW3	Savanur tank	Surface water	14°58′33.9″N	75°20′46.37″E
4	GW1	Teggihalli	Ground water	14°58′5.59″N	75°17′51.31″E
5	GW2	Tallihalli	Ground water	14°56′25.56″N	75°22′57.11″E
6	GW3	Ichal Yellapur	Ground water	14°56'0.88"N	75°27'16.79"E

7	GW4	Challal	Ground water	14°55'12.43"N	75°18'58.58"E

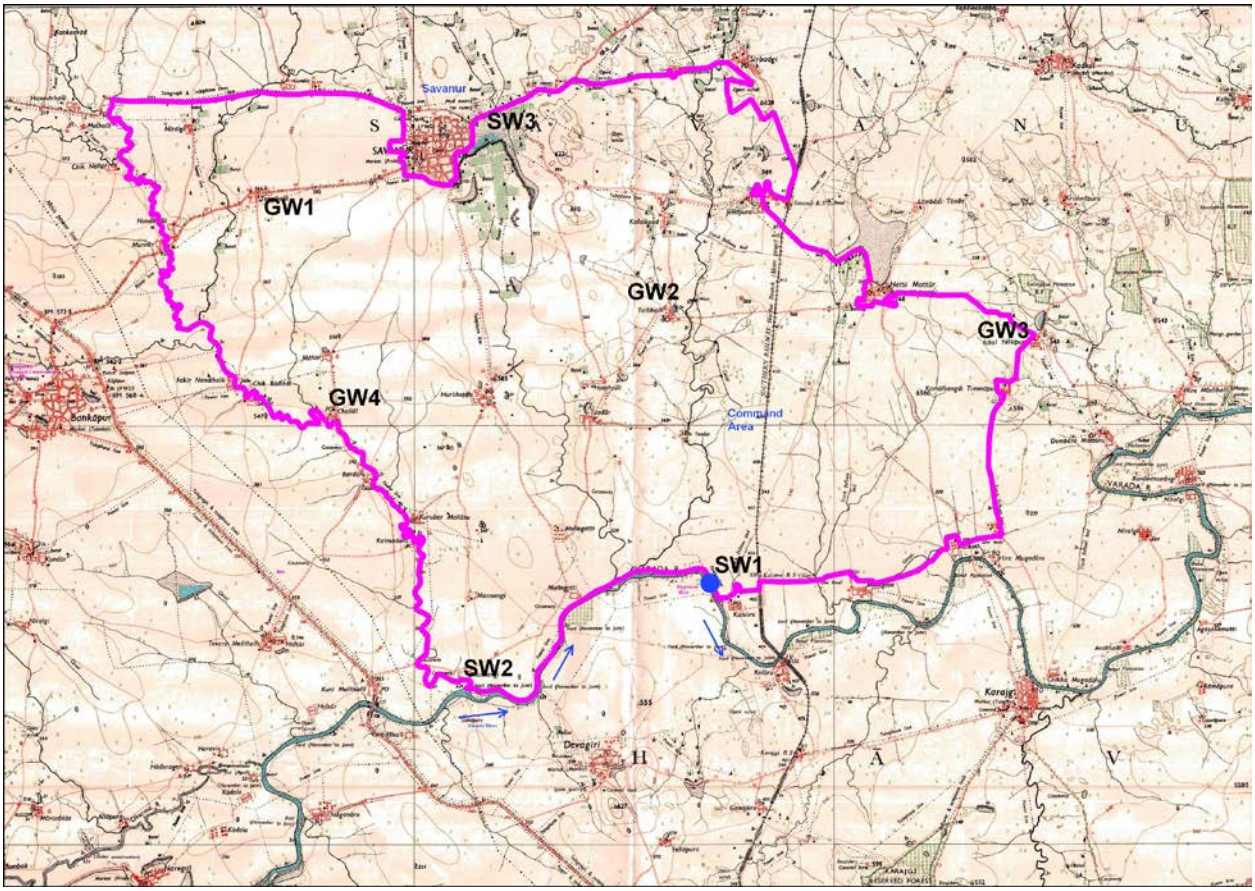

Figure 2 - Proposed location of Water Sampling Stations on Toposheet

Table 3: Details of proposed ambient air quality monitoring stations.

Sl. No	Sample Code	Sample location	Latitude	Longitude
1	A1	Lift point near Kalasur village	14°53′02″N	75°23′34″E
2	A2	Challal	14°55′27.38″N	75°19′14.82″E
3	A3	Savanur	14°57′50.23″N	75°20′15.15″E
4	A4	Kamal bangadi Timmapur	14°55′32.49″N	75°26′58.91″E
5	A5	Jallapura	14°57'46.22"N	75°24'8.06"E

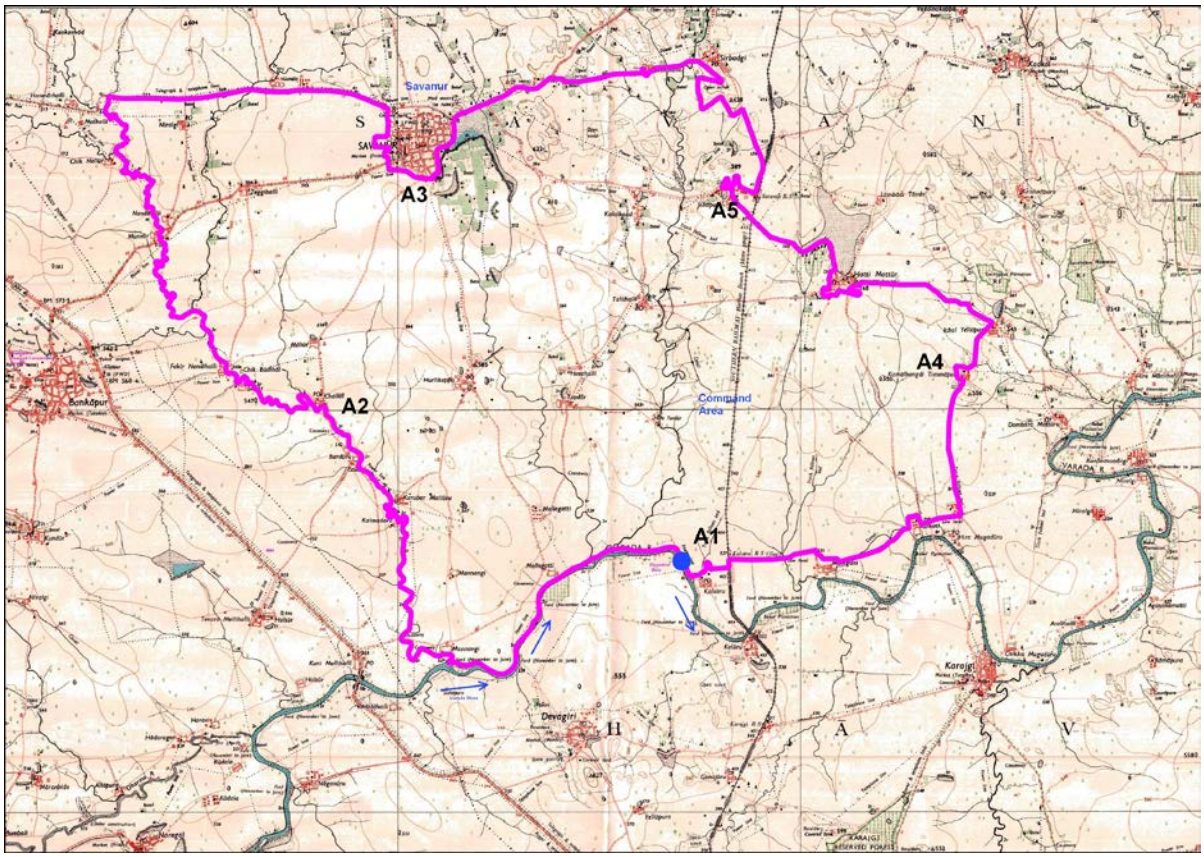

Figure 3 - Proposed location of Ambient Air Quality Monitoring Stations on Toposheet

Table 4: Details of proposed noise level monitoring stations.

Sl. No	Sample Code	Sample location	Latitude	Longitude
1	N1	Lift point near Kalasur village	14°53′02″N	75°23′34″E
2	N2	Challal	14°55′27.38″N	75°19′14.82″E
3	N3	Kamal bangadi Timmapur	14°55′32.49″N	75°26′58.91″E
4	N4	Jallapura	14°57'46.22"N	75°24'8.06"E
5	N5	Savanur	14°57′50.23″N	75°20′15.15″E

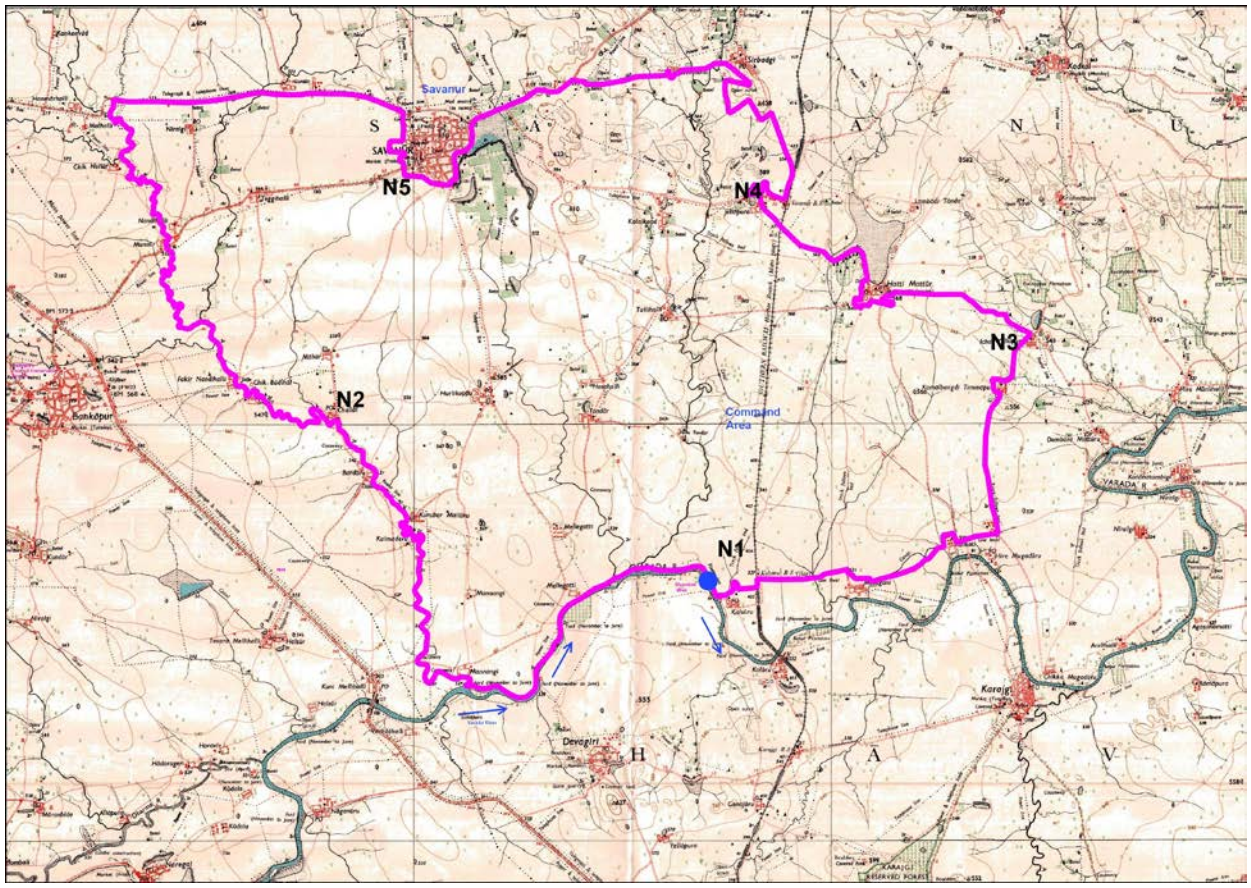

Figure 4 - Proposed location of Noise Level Monitoring Stations on Toposheet

1.4 Draft Terms of Reference (TOR's) Proposed to be covered in EIA/EMP Studies Report

1.4.1. Baseline Environmental Studies

- The baseline environmental studies consists of three season field data i.e. Pre Monsoon, Post Monsoon and Monsoon.

a) Physico-Chemical Environment

- Physical geography, Topography, Regional Geology and presence of mineral deposits, if any in the study area.
- One year weather data (Temperature, rainfall, RH, wind speed, wind direction, etc) from Nearest IMD station.
- Ambient air quality parameters such as Particulate Matter (PM_{10}, $PM_{2.5}$), Sulphur dioxide (SO_2) and Oxides of Nitrogen (NO_2) for the study area at 5-6 locations.

- Existing Noise Levels in the study area at 5-6 locations.
- Soil studies considering irrigation component of the project: includes Soil Quality analysis for Physico-Chemical parameters (viz. Soil Type, Texture, Porosity, Permeability, Water Holding Capacity, Bulk Density, pH, Electrical Conductivity, Magnesium, Calcium, Total Alkalinity, Chlorides, Sodium, Potassium, Organic Carbon, Available Potassium, Available Phosphorus, SAR, Nitrogen and Salinity) in the study area at 5-6 locations.
- Physical, Chemical and Bacteriological parameters of water quality (both surface and ground water) such as pH, Electrical Conductivity, Total Dissolved Solids (TDS), DO, Turbidity, Alkalinity, Ca, Mg, Total Hardness, Chlorides, Iron, Fluorides, Phosphates, Sulphate, Nitrates, Sodium, Potassium and Bacteriological parameters comprises of Fecal and Total coliform.
- Water use and existing projects upstream and downstream.
- History of groundwater table fluctuation in the Proposed Command Area.
- Command Area Development plan
- Method of sewage and solid waste disposal in labour camps and in staff colony.
- Landuse and landcover analysis using remote sensing data, drainage, terrain, contour maps and soil map.

b) Biological Environment

- Characterization of forest types in the study area, if any and extent of each forest type.
- General vegetation pattern and floral diversity.
- Economically important species viz. non-wood forest producing species, including medicinal plants, timber, fuel wood etc.
- Categorization of Flora/Fauna using International Union for the Conservation of Nature and Natural Resources (IUCN) Red list Status
- Cropping and Horticulture pattern and practices in the study area.
- Birds (resident, migratory), Land animals including reptiles, amphibians, fishes and insects in the study area.
- Details of endemic species found in the project area/study.
- RET flora species will be classified as per IUCN Red Data list, 2008. Details of endemic

species will be provided.

- Impact on Bankapura Peacock Conservation Reserve from the proposed project.
- RET fauna species will be classified as per IUCN Red Data list, 2008. Details of endemic species will be provided.
- Aquatic Ecological study of Varada River including documentation of status of fishes, zoo and phyto plankton, benthos etc.
- Compensatory afforestation to compensate the greenbelt area that will be removed if any as part of proposed project development and loss of biodiversity. Identification of suitable native floral species for compensatory afforestation and green belt development.

c) Environmental Impact Assessment (Impact Identification and Prediction)

The impacts that will be assessed on various components of the environment during construction and operational stage of the proposed project will be given under the following headings:

1) **Land Environment**
   - Immigration of labour population.
   - muck generation and disposal
   - Operation of construction equipment
   - Construction of roads, etc.
   - Acquisition of Land
   - Seismicity
   - Inundation of land
   - Change in land use pattern and topography etc.,
   - Impact on Soil and Water environment of proposed Command Area.

2) **Water Environment**
   - From labour camps/colony
   - From equipments washings
   - Change in hydraulic regime and downstream flow
   - Impact on downstream users and environmental flows
   - Water pollution due to disposal of sewage

- Impacts on river water quality

3) Terrestrial Flora

- Pressure on existing natural resource
- Loss of floral diversity

4) Terrestrial Fauna

- Disturbance to Wildlife, if any.
- Impacts on Avian-Fauna, if any.

5) Aquatic Ecology

- Impacts on aquatic ecosystem and biodiversity
- Impact on fish fauna
- Fish population
- Change in aquatic diversity

6) Noise Environment

- Anticipated Increase in Noise Levels during construction
- Impact of noise levels on hearing
- Effect on fauna and human health

7) Air Environment

- Pollution due to fuel combustion in equipments
- Pollution due to fuel combustion in vehicles
- Effects on human health
- Dust pollution
- Impact of emissions from DG sets used for construction on air environment.
- Fugitive emissions from various sources

8) Socio Economic Environment

- Impact of the socio-economic status
- Impact on yield of crops due to irrigation
- Impact on human health due to water/vector borne disease
- Impact on the local community including demographic changes

9) Public Health Environment

- Impacts on Occupational Health and status.

- Endemic disease
- Human waste disposal
- Sewage Disposal

d) Environmental Impact Evaluation

Environmental Impact Analysis/Evaluation during construction and operation phases of the proposed project will be carried out adopting matrix system considering impacts without EMP and with EMP aspects.

e) Environmental Management Plan (EMP)

Environmental Management Plan (EMP) aims at minimizing the negative impacts of the proposed project on the surrounding environment. The mitigation measures for all the likely adverse impacts on the environment due to the project's various activities will be given under the following headings:

- Air Quality Management Plan
- Water Quality Management Plan
- Noise Level Management Plan
- Environmental safeguards (management) during construction activities
- Muck Disposal Plan
- Management to arrest salinity/ alkalinity in the wake of irrigation
- Command Area Development and its performance evaluation in respect of irrigation potential
- Ground water management including harnessing of ground water in conjunction with surface water.
- Public Health Management Plan
- Subsidized Fuel Management Plan
- Compensatory Afforestation Scheme in consultation with the State Forest department, Karnataka, if trees get uprooted.
- Greenbelt Development Plan
- Road Side Plantation
- Public Health Delivery System including the provisions for drinking water facility

for the local community.

- Sanitation & Solid Waste Management Plan for domestic waste from colonies and labour camps, etc.
- Restoration and Landscaping of Project Sites
- Socio-Economic Development Aspects
- Water Environment, Air Environment & Noise Environment Management during construction and post-construction periods.
- Environmental Monitoring Programme (With physical & financial details covering all the aspects of EMP i.e Budgetary allocation estimated for EMP will be included) and Environmental Management Cell
- Cost on Environmental Protection Measures.

Summary

- Assessment of the existing status of major environmental components viz. Air, Water, Soil, Noise, Hydrology, Geology, Climatology, Ecology/Biodiversity, Ichthyology, Terrestrial Habitats, Land use, Socio Economic aspects and others.
- Identification of potential impacts on various environmental components due to activities envisaged during construction and operational phases of the proposed project.
- Impact identification and prediction on the major environmental components using matrix system.
- Delineation of Environmental Management Plan (EMP) outlining preventive and curative strategies for minimizing the adverse impacts due to construction and post construction (operational) phases of the proposed project along with the budgetary allocation estimated for EMP implementation.
- Formulation of Environmental Monitoring Programme during construction and operational phase of the project.

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