

EXECUTIVE SUMMARY

1.0 PREAMBLE

India is a large country with a proven potential to utilize its all resources for multigonal and steady development of mankind. For existence of life water is an utmost essential commodity for us. Indian agriculture was solely dependent on annual tropical monsoon rain fall to occur. In past man performed storage of water for drinking and for crops in many forms, irrigation was his invention in crop yield. It enhanced crops in famine zones and low rain fall sectors. It paid him handsomely in all types of soil and land. Irrigation led him to get benefits of plant protection from frost, weed suppressor in grain fields, soil consolidation prevention too. Thus irrigation was giving assistance for farming for generations together in past.

Use of irrigation with reference to soil drainage nature, type and nature of soil, climate variation, availability of surface and sub surface water quantity has helped farmers to raise their yields and also their living standards. Thus irrigation is an unevitable part of Indian economy. Irrigation covers two types as canal and lift, both of them have a specific role to play for assured water distribution and utilization.

Ujjani Canal Modernization, Solapur undertakes the proposed project for the welfare of the region. Unirrigated cultivable land will be brought under irrigation. It is proposed to lift 1.99 TMC of water made available from Ujjani Reservoir through Ujjani River Bank Canal in K.M. 37 and to feed to existing Tandulwadi village in taluka Malshiras district Solapur from EL. 466.225 m to EL. 541.240 in through 11.50 km long rising main and static head of 75.015 m gross head 96.41 m from delivery chamber water will be fed to Nira Right Bank Canal in Mile No. 92 through gravity canal of 2520 km length. This lifted water will be fed to existing branch 4 & 5 of N.R.B.C. to irrigate the command identified under this project.

1.1 NEED OF THE PROJECT

The identified command area lies in Sangola

taluka of Solapur district in Maharashtra which is a drought prone area extension of existing Nira Right Bank Canal. No major irrigation facilities are available in this area. In order to provide irrigation facilities to the area which is not covered under N.R.B.C. extension, this irrigation scheme proposed project site and command area is taken as study area for the purpose of EIA study. Scope of the present EIA study covers a detailed characterization of environment in the various environmental components.

Following are the targets of the present EIA study:

- To assess the present status of water, land, ecosystem and socio-economic components of environment.
- To identify and quantify significant impacts of operations on the environment, if any
- To prepare Environmental Management Plan outlining appropriate control technologies to be adopted for mitigation of adverse impacts, if any
- To delineate future environmental quality monitoring program to be pursued by the proponents.
- Baseline data have been collected for various environmental components viz. Air, Noise, Water, Land and Socio-economics during the period of Sep. 2012 to May 2013 and are presented in this report along with prediction and evaluation of the impacts.

1.2 GENERAL DESCRIPTION OF PROJECT:

The command area proposed to be benefited by this project is drought prone area which lies in Sangola taluka of Solapur district in Maharashtra State. In order to bring some area under irrigation a project name "Sangola Branch Canal Project" was administratively approved by Govt. resolution. Letter Number MIP/2078/1723 (1612) WR/I dated 22.2.80. In this project, existing Nira Right Bank Canal is proposed to be extended, as Branch (S) i.e. Sangola Branch under which 6525 Ha area is proposed to be irrigated. Water requirement for this is to be met from the savings in transit and seepage losses by providing lining to existing Nira Right Bank Canal from Nile No. 71 to 105, Branch No. I, III & Major distributaries on them.

Total culturable command under Br 4 & 5 of N.R.B.C. is 17876 Ha, but only 1853 Ha is covered under existing Nira Right Bank Canal Branch 4 which gets irrigation facilities for Kharif season and 6883 Ha under Branch 5 which is proposed to be irrigated under Sangola Branch Canal, project is proposed to be irrigated under existing Nira Right Bank Canal extension. There still remains area about 4673 Ha which can be brought under irrigation but at present not irrigated because of non-availability of water. Similarly existing 1853 Ha of N.R.B.C. Branch 4 cannot get irrigation benefits for 8 monthly cropping pattern due to non availability of water in Nira system further. To fulfill these both requirements about 1.99 TMC of water is required.

After construction of Ujjani Project about 29 K.T. weir are either constructed or under construction in the command area of Ujjani Project. Water availability in the K.T.Weirs will be

from their catchment. Total storage capacity of these K.T. weirs is 3.178 TMC. Command area proposed under these K.T. weirs and Ujjani Project overlaps, which is about 34190 Ha. For this area minimum 3.18 TMC of water will be available from K.T. weirs and balance requirement can be fulfilled from Ujjani Reservoir. Hence there would be a saving of 3.18 TMC water in the Ujjani Reservoir which can be utilized for bringing additional area under irrigation.

In this regard a meeting was held by the Chairman M.K.V.D.C., H'ble Irrigation Minister and MLAs from Solapur district on 13.1. 2000 at Pune. In this meeting it was decided to make available 2 TMC of water from Ujjani Canal for Sangola Lift Irrigation Scheme and submit Project Report for this scheme on top priority.

Considering the decisions in the above mentioned meeting it is proposed to make 1.99 TMC of water available (out of above 3.18 TMC saving) for the proposed Sangola Lift Irrigation Scheme in the Sangola taluka of Solapur district to fulfill the above demands.

For this, it is proposed to release water from Ujjani reservoir through existing Ujjani Right Bank Canal (URBC), and feeding same to the existing RBC near village Tandulwadi (taluka Malshiras, district Solapur) through an inlet channel off taking from U.R.B.C.K.M.37, near Dhanore water will be lifted to highest point near Salmukh chowk, further fed to existing N.R.B.C. and further water will be supplied to N.R.B.C. Branch 4 & 5. Under this project it is proposed to (i) convert existing 1853 Ha. of N.R.B.C. Branch 4 from 4 monthly (Kharif Branch) to 8 monthly cropping pattern, and (ii) irrigating additional area 4673 ha. under N.R.B.C. Branch 4 and 5 which is not considered in Sangola Branch Canal Project.

1.3 SCOPE OF THE SCHEME

In this scheme it is proposed to provide irrigation facilities to total 6525 ha. Split up to which is as below

1. Additional 4673 ha. Area under N.R.B.C. Branch 4 and 5 (Br.4 1231 ha. Br. 5 3431 ha)
2. To convert 1853 ha area of existing Branch 4 from Kharif branch to 8 monthly cropping pattern.

2.0 SALIENT FEATURES OF SANGOLA L.I.S. PROJECT

No.	Features	Particulars
1	Scope	Lift irrigation Scheme with Lifting of water from Ujjani RBC to Existing Nira RBC in single stage, irrigating about 6525 Ha area in Sangola taluka of Solapur District.
2	Source of Water	Ujjani Storage, water available from saving due to

		overlapping command of solapur district.
3	Location	
	a) State	Maharashtra
	b) Region	Western Maharashtra
	c) District	Solapur
	d) Taluka	Sangola
	e) Village	Village Tandulwadi, Taluka Malshiras, District Solapur
	f) Topo Sheet no.	47 K/13, 43 k/14, 47 O/1 & 47 O/2
	g) Latitude	17° 44' 34" N
	h) Longitude	75° 6' 55" E
4	Source of water	Ujjani reservoir
5	Annual Water Utilization	T.M.C. 1.99 Mcum
6	Details of Lift	
	a) ICA	6525 Ha
	b) Lift Level	From 489.205 To 541.240
	c) Design Discharge to be lifted	6.22 Cumecs
	d) Rising Main	1Row, 1700 mm dia 10 mm thick L=10.98K m
	e) Static Head/ Gross Head	59.79 m/13.95 m
	f) Pumps	Total pumping capacity 9450 HP (of 4 working pumps)
	g) Size of Pumphouse	16 X 20 m
	h) Length of Inlet Channel URBC to pump house	50
	i) Feeder Channel (Delivery Chamber to N.R.B.C)	2610m
7	Canal	This lift irrigation scheme is proposed for fulfillment of irrigation requirements of area under branch No. 4 & S of N.R.B.C.(Sangola Branch) which is not covered under existing N.R.B.C.Branch No. 4 & 5 can be used and hence no separate canal system required.
8	Command Area in Ha, GCA CCA ICA	24667 Ha 17876 Ha 6525 Ha

	No of Villages Benefited	<p>a) 1853 Ha. existing area of from Kharif cropping pattern to 8 monthly cropping pattern.</p> <p>b) 1231 Ha. Additional area of Branch 4 will be irrigated.</p> <p>c) 3442 Ha additional area of Sangola Branch will be irrigated.</p> <p>22, all in Sangola Taluka</p>
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Statement showing the village wise command area

No.	Village name	I.C.A considering 75 % of CCA i.e 0.75 * 10	ICA proposed under this project Ha
1	Shivane	1049	386
2	Waki	822	299
3	Dhayti	761	281
4	Chincholi	626	226
5	Ekatpur	1343	490
6	Sangola	1883	681
7	Mangewadi	393	131
8	Kamalapur	341	113
9	Wasud	240	80
10	Akola	366	122
11	Ajanale	734	245
12	Watambare	280	93
13	Chicumbe	236	79
14	Ankdhal	206	69
15	Kadlas	851	284
16	Jawala	1299	433
17	Medshingi	510	170
18	Alegaon	424	141
19	Wadegaon	473	158
20	Rajapur	86	29
21	Save	332	110
22	Dewale	155	54
	Total	13410	4673

2.1 LOCATION OF THE PROJECT

The project is located at village Tandulwadi, taluka Malshiras, district Solapur, Maharashtra which is uptake point for Sangloa LIS. The command area lies in Sangola taluka Solpaur district.

The geocodes are as under -

No.	Location	Latitude N	Longitude E	Elevation MSL M
1	Uptake point	17° 44' 34"	75° 06' 55	489
2	Tandulwadi	17° 41' 46"	75° 03' 41	512
2	Delivery Chamber near Salmukh chowk	17° 40' 46"	75° 02' 31	537
3	Command area Sangola	17° 44' 42"	75° 02' 22	502

Pump house is proposed on the U.R.B.C. at 42/350 in lane 43 near Tandulwadi, taluka Malshiras district Solapur. Pump house location is approachable from Pandharpur Mahad State Highway.

Access and Roadways

The proposed lift scheme is near village Tandulwadi, taluka Malshiras district Solapur which is accessible from Pandharpur Mahad State highway. It is near about 90 km away from Solapur City for railway facility. Pandharpur is about 30 Km away from the site location.

Railway

Solapur is one of the largest railway junction on Mumbai Chennai and Hyderabad tracks of southern railway and is one of the five divisions of Central Railway zones of Indian Rail way. It is well connected by direct trains to most major cities like New Delhi, Mumbai, Chennai, Bangalore, Hyderabad, Warangal, Tiruanantpuram, Cochin, Allahabad, Pune etc. Solapur is a terminal for Vijapur and Hubali tracks also. Miraj, Pahdharpur Kurduwadi track of South Central railway passes through command area, and Sangola, taluka place is one of the stations on this track.

Many cities and district places in Maharashtra are connected to Solapur. NH 9, Pune to Hyderabad, NH 13 Solapur to Mangalore, Karnataka and NH 211 Solapur to Dhulia pass through the command area. It is well connected to adjoining districts of Karnataka, Goa and Andhra Pradesh like Bijapur, Gulbarga, Belgam, Goa, Dharwad, Karimnagar, Warangal, Adilabad, Siddipeth etc.

Airport

Solapur city airport [IATA code:SSE (5)] is the nearest airport at distance of about 100 Km.

2.3 SURVEY

2.3.1 Benchmark Carrying-

The project components (Pump House, Rising Main etc.) lie nearby existing Ujjani Right Bank Canal. These canals are constructed considering G.T.S. bench mark. Hence no separate bench mark is carried out for this scheme. For the Components near U.R.B.C., bench mark value of nearby structure is used and similarly for components near N.R.B.C.

2.3.2 Survey Details-

Detailed survey is carried out for preparation of this Draft Project Report

2.3.3 Topographical Survey

1) Block contour survey has been carried out considering 10 m grid size for the Pump House and delivery chamber.

Alignment survey has been carried out for inlet channel (U.R.B.C. to Tandulwadi K.T. weir) and feeder channel (Delivery chamber to N.R.B.C.)

2.3.4 Geological Investigations

1) Trial bores (5 Nos.) at proposed Pump House location and one trial bore at proposed location of Delivery chamber

2) Trial pits are taken at 200 m interval along the alignment of inlet channel, feeder channel, and rising main.

2.4 LOCATION OF PUMP HOUSE

Pump house is located on the fringe of existing Tandulwadi, taluka Malshiras, district Solapur. Location of head worker i.e. pump house, rising main and delivery points are decided such that length of rising main will be minimum.

2.5 COMMAND AREA

The gross command area of the project is 24667 ha, out of which culturable command area is 17876 ha and irrigable command area is 6525 ha. Command area lies in Sangola taluka district Solapur. No detailed survey of the command area has been carried out.

2.6 POWER

Being lift irrigation scheme provision of power outlet as in the case of dam does not apply for the project.

On the contrary power will be required for lifting of water. Power requirement will be as follows

Pumps Working			Annual power requirement
H P each	Nos	Total HP	In Lakhs Unit
1395	4	5580	177.50

During Construction 100 KVA DG sets, 1.0 kl diesel will be needed.

During operation stage for lifting of water 4532 KW power will be required.

It is anticipated that this much quantum of power will be available in future.

3.0 BASE LINE STATUS OF THE ENVIRONMENT

3.1 PHYSIOGRAPHY OF THE SITE

It is proposed to lift 1.99 TMC of water made available from Ujjani Reservoir through Ujjani River Bank Canal in K.M. 37 and feed to existing RBC near village Tandulwadi from EL. 489.205 To 541.240 in through 11.50 Km long rising main and static head of 75.015 m gross head 96.41 m from delivery chamber water will be fed to Nira Right Bank Canal in Mile No. 92 through gravity canal of 2520 km length. This lifted water will be fed to existing branch 4 & 5 of N.R.B.C. to irrigate the command identified under this project.

Geocodes of pump house are-

Latitude is 17° 44' 34" N and Longitude is 75° 6' 55" E.

3.2 DRAINAGE AND RELIEF PATTERN

In Solapur district Bhima is the main river, Man and Nira are its main right bank tributaries while Sina its left bank tributary. Both Bhima and Sina flow in south east direction. Nira flows eastward while Man flows in north east direction. During dry season all the rivers are fordable. This project neither envisages construction of any reservoir nor utilisation of any extra water. It, merely is an augmentation of existing Nira system and the requirement of water is proposed to be met from the saving of water in the Ujjani reservoir due to overlapping area of K.T. weir in the command area of Ujjain Project.

3.3 GEOGRAPHY

Solapur district observes salient features as follows

1. The western foot hill regions in the southern part of Malshiras and Western Sangole.
2. The Nira basin in Malshiras Tahsil
3. The Man basin in Sanagole, Mangalvedha and Southern part of Pandharpur
4. The Bhima Valley in Western Karmala, eastern Malshiras, Pandarpur, parts of Mangalveda and South Solapur.

3.4 TOPOGRAPHY

The topography of the command area is flat, & nearby has very gentle slope.

3.5 MICROMETEOROLOGY

In general Solapur district is pleasant with large dryness in maximum part of year. The total command area lies in hot weather region having inadequate and scattered type rainfall in a range of 300 to 550 mm. The area is generally dry except in rainy season. The weather report says that a maximum temperature is 45 °C in summer and minimum of 10 °C in winter.

Cold season in December to February, hot season in March to June, June to September tropical monsoon whole October to December retreating monsoon are 4 divisions in climate of Solapur district.

3.6 AIR ENVIRONMENT

Ambient air quality motoring was carried out in post monsoon, winter and summer season at four locations viz, Uptake point, Sangola, Shivane, Bamani, Kadlas site, within buffer zones of the proposed project during Mar. 2012 to Feb. 2013 representing entire year.

3.7 NOISE ENVIRONMENT

Noise level has been checked around 11 locations in study area at Uptake point, Sangola, Shivane, Bamani, Kadlas, Save, Wadegaon, Kamalapur, Wasud, Akole, Watambare for three seasons Noise level was observed in the range of 50 to 54 dBA, thus below CPCB standards.

3.8 LAND ENVIRONMENT

CROPPING PATTERN

About 15 cereals are grown in Solapur district. Amongst them Jowar, Bajri, Wheat, Roce, Maize, Barley are prominent but Varia, Sava, Bhandi, Ragi etc. are also grown.

EXISTING CROP PATTERN			PROPOSED CROP PATTERN		
No	Name of Crop	%	No	Name of Crop	%
A	Two seasonal 1 Cotton(wells)	1	A	Two Seasonal	
	Total	1	1	Cotton(L.S)	5
B	Kharif Seasonal		2	Chilies	5
1	Bajara	17		Total	10
2	Pulses	6	B	Kharif Seasonal	
3	Jawar	1	1	Hy.Jawar	20
4	Maiz	1	2	Groundnut	20

5	Fodder	1		3	Vegetables	6
6	Groundnut	1		4	Sunflower	2
	Total	27			Total	48
C	Rabi Seasonal			C	Kharif	
1	Wheat	2		1	Seasonal(Unirrigated) Pulses	15
2	Jawar	41		2	Bajara	5
3	Gram	1		3	Cotton	10
4	Sunflower	3			Total	30
	Total	47		D	Rabi Seasonal	
D	Perennials			1	Wheat (High Yield)	15
1	Sugarcane(on Wells)	1		2	Rabi Vegetables	6
	Total	1		3	Hy. Jawar	12
	Grand Total	76		4	Sunflower	3
				5	Jawar (High Yield)	15
				6	Gram	20
				7	Fodder	5
					Total	76
					Grand Total	164

Forest Area

The district has a very limited area under forests, mostly arid and scrub forest patches in Sangola and Malshiras talukas. The remaining forest area is included in Malshiras range, Akkalkot round and a part of Jath round.

3.9 SOIL QUALITY

The Command Area is covered by Brown /Black and Dry Soil. In the district soils are essentially derived from the Deccan trap which is the predominant rock formation of the district. The geographical foundation of soils prevailing in Solapur district is mainly from Deccan trap of volcanic origin viz. "Basalt". The soil is underlain by partially decomposed basaltic rock locally known as "Murum" which overlies parent material. On account of more or less complete absence of leaching the soil are base saturated the exchangeable calcium being the predominant cation. The free lime content is fairly high (5 to 10 %). The soils exhibit varying

degree of erosion and truncated profile. Generally soils are clay in texture with predominant montmorillonite clay mineral. Because of the clay minerals, the soils exhibit swelling and shrinkage property on wetting and drying develop cracks after rainy season. The soils are generally low in total nitrogen, low to medium in available phosphorous and high in available potash. The soils in the district can be classified mainly on the basis of depth i.e medium deep soils (22.5 to 90 cm) dominate the soil profile with 45 % of area followed with 25 % of deep soils of more than 90 cms of depth. About 30 % of the area is under shallow soils.

The details of the soil type of Sangola are as follows

Soil type	Characteristics
Shallow soils	Soil depth is less than 22.5 cms. Water availability period less than 100 days.

3.10 WATER ENVIRONMENT

Ground water as well as surface water samples were assessed in the study area of the project for water quality in order to identify any impact of these chief water sources.

Sampling near Ujjani R.B.C.

Water quality of uptake point, Shivane, Sangola, Bamni, Kadlas is compared with the water standards given in IS 17400. It is observed that levels of all parameters in all the samples were below their respective permissible limits.

3.11 ECOLOGY

FAUNA & FLORA

The main trees found in the area are Neem, Sishu, Babul, Bor, Tarwad, Henkal, Dongri, Kusali Pavanya, Sheda, and Marvel, Wad, Badam, Chinch, etc.

Fauna

The common species of fauna in this forest area is the Blackbuck, Wolf, Indian Fox, Jackal, Rankombda, Kalvit, Deer, Rabbit, Black drango, Peacock, Tortoise, Fishes, etc.

3.12 SOCIO-ECONOMIC

In an EIA study, assessment of Socio-economic environment effects plays a key role. Presence of Demography, Occupational Structure, Community Services such as Post Offices, Post & Telegraph Offices, Telephone, Educational and Health Care Facilities, Banks and Co – Operative institutes, social and Cultural Institutions are observed in command area. Many sugar

manufacturing and co-generation units progress in area supplying sugar cane like Malinagar, Akaluj, Malshiras, Akkalkot etc. In cotton textile processing Solapur district is progressing since last 150 years. About 14 large scale factories and 870 small scale units are established in the district.

4.0 IMPACT PREDICTION & MITIGATION MEASURES

4.1 IMPACT DURING CONSTRUCTION PHASE

Main activities in construction phase for pump house, rising main, distribution chambers, canals involve demolishing, excavating, leveling, drilling, blasting will cause some impact on environment. An increase in the level of pollutants will be kept within CPCB limits.

4.2 IMPACT DURING OPERATION PHASE

Air Environment

Later to construction phase no operation will create any effect on air quality for pump house, rising main area. Impact will be solely due to any vehicular traffic on roads. It may be stated that no threat can be there to ecology.

Noise Environment

Working of pumps will lead to noise levels, it will be maintained in lower frequencies by keeping pumps in noise resistant cabins. Thus the said impact will be quite low. Thus noise levels will be at minimum level and will not affect in operational phase.

Water Environment

Pumped water shall be used to supply to farms. Water stocks at each stage will be replaced by fresh one. As local needs are fulfilled, it will show some positive impact.

Land Environment

Acquired land for pump, rising main, canal will bring about permanent alteration in topography of the region. A positive impact of the scheme will fetch hand some returns. Area under irrigation and cultivation will be more.

Biological Environment

In operational phase tree plantation program is proposed. It will raise vegetation, growth in ecology.

Availability of water for crops will raise crop yield resulting in both direct and indirect rise in employment. It will help initiation of agro based industry like cattle feed, dairy and linked products, fruit based products, fodders and packaging sector. Finally people will experience wealth and stability in life.

Irrigation Projects and Mitigation Measures

Impact	Mitigation
Deterioration of irrigated land	Match the demand of water, supply adequately
Salinization	Provide drainage including disposal of water to evaporation ponds if quality of river flow adversely affected by drainage water.
Alkalization	Prevent seepage through maintenance of channel, and reduce inefficiencies resulting from siltation and weeds
Water logging	No water logging will observed
Soil acidification	Analyze soils and monitor changes so that potential problems can be managed
Increased incidence of related disease	- Educate about causes of disease.
Weaker community infrastructure	- Allow sufficient time and money for extensive public participation to ensure that plans are optimal, that all sections of affected society are considered and that local institutions are in place to sustain irrigated agriculture, particularly in respect of land and water rights.
	- Consider markets, financial services and agricultural extension in conjunction with proposed irrigation and drainage changes.
	- Ensure that agricultural intensification does not preclude economic or subsistence activity, such as household vegetables, fodder or growing trees for firewood.
	- Provide short-term support and/or skills for an alternative livelihood if irrigation removes existing livelihood
Reduction in irrigation quality	- Control waste disposal in water bodies
	- Educate for pesticide or sewage contamination dangers.
	- Monitor irrigation water quality

Ecological degradation	- Define ecological requirements.
Ground water depletion	- Define and enforce abstraction regulations.
Dry drinking & irrigation wells	- Monitor ground water levels.

5.0 ENVIRONMENT MANAGEMENT PLAN

Insurance of an optimum EMP will definitely bring about the use of water supply to the region and people. It will make possible for the project proponents to distribute necessary funding to implement and create a needed socio-economic environment in improvement of life quality of the people.

5.1 DURING PRECONSTRUCTION PHASE

Tree cutting

It will occur on bare and unused part of land or cultivated land with no crop, tree cutting will hardly occur. In order to save existing trees circular iron cages will be arranged.

Base line parameters

Air, water, soil and noise quality was checked, recorded. Optimum measures will be arranged to keep them as per norms.

Traffic arrangement

At respective location like rising main, pump house and canals, supply of construction material will be done. It covers regular survey, avoiding of crowd and traffic jam and chiefly safety of the hazardous materials in transit.

Material storage

At exact locations provision is made to store the construction material.

Labour houses

It proposed that no labour houses will be allowed. For this local labour will be preferred. They will be supplied with water and other facilities.

5.2 DURING CONSTRUCTION PHASE

All infrastructural items will be included in EMP with precise specifications. It will lessen the sensitivity of impact of each component. Thus EMP will be time specific, optimum to curtail both good and bad impacts.

The construction phase involves a preparatory phase during which the following activities have to be carried out

- Clearing & Clearing of the site for construction of offices /residential quarters
- Clearing & cutting of forest in water spread area
- Transportation of heavy machinery & equipments & construction material
- Drilling, Blasting, Quarrying & transporting rock at the respective construction site

For mitigating the adverse impact during this phase, the following measures are suggested

- ❖ Provision of cut off drains and holding tanks, growing, different varieties of grass on the loose soil and on construction debris to prevent soil erosion and associated impacts
- ❖ Proper and adequate residential facilities with power, water supply and sanitation
- ❖ Proper supply of fuel needed by the labor to ensure that they do not cut trees in the region, treatment of domestic wastewater and garbage disposal
- ❖ Mobilization of local NGOs to generate environmental awareness among the local people with specific reference to the project activities and to achieve their participation in the developmental project.

5.3 DURING POST CONSTRUCTION PHASE

There can be effect on creatures in water. This ecological scenario will be balanced by appropriate water levels at rising main, pump house and canals.

5.4 GREEN DEVELOPMENT PLAN

Implementation of plantation in the vicinity of the pump house, rising main and both banks of canals .Additional program of lawn, herb, shrub and tree plantation will make the area green.

5.5 HEALTH ACTION PLAN

Correct irrigation of land is highly demanded and will be achieved by this project. Certain adverse effects on health may occur on them.

The change in environment equally effects the population living in the vicinity of the area. They are exposed to increased humidity, insects, and parasites. All these causes together are responsible for increased incidences of diseases and increased morbidity load on the area. It needs immediate effective actions through preventive, curative and primitive health services.

Objectives of Health Management

- To increase the coverage of prevention interventions for vector borne diseases amongst the population at risk
- To reduce morbidity due to malaria
- To prevent deaths due to malaria
- Industrial & Agricultural Development activities should not be affected due to malaria
- The gains achieved so far should be maintained.
- To enhance the access to early diagnosis and complete treatment
- To strengthen the technical and managerial capacity of the vector borne diseases control program and increase the leverage with private sector
- To increase the visibility of vector borne disease control program
- To undertake output based monitoring of the control program

5.6 BUDGET PROVISION FOR EMP

Adequate budgetary provisions have to be made by the management of project to execute the Environmental Management Plan as delineated above. The details of project cost, annual recurring budget and capital investments to be earmarked for pollution control, operation/maintenance, social welfare measures, and for greenbelt development are proposed.

Sr. No.	Component	Cost Rs .in lakh
1	Lawn and garden	7.1
2	Sanitary Work	2.4
3	Plantation	58.50
4	Provision communication service	1.5
5	Environment Monitoring Program	11.0
	Total	80.5

6.0 RESETTLEMENT AND REHABILITATION

It is a sad experience in past that some groups of people suffer a lot as they lose land they possessed for generations. Consequently it is a monetary loss to them. To avoid injustice to such affected people MKVDC has taken steps to follow Rehabilitation action plan. As a token for the same such people will be considered as **People Sacrificing For the Project [PSFP]** instead of **Project Affected People**.

MKVDC will strictly follow the procedures laid down under the Maharashtra rehabilitation and resettlement Act 2004 and Land Acquisition Act 1894 and R & R Rule when land is acquired for various components of Sangola LIS. The process of land acquisition for the proposed LIS was started by Section-4 notification in April, 2006 followed by Section –6 notification on 27-04-2006. After the joint measurement and marking of the land under section 7 and 8 the Section-9 notification along with individual notices to interested persons were issued. Inspection/spot verification by Land Acquisition Officer was completed in was issued in April / May, 2006 for fixing the rate of compensation. Final award through Section-11 by Land Acquisition Officer was issued in May, 2006. Now remaining land acquisition is done by private negotiation. Negotiation is under progress.

7.0 ENVIRONMENTAL MONITORING PROGRAM

Monitoring Schedule and Parameters Environmental Monitoring Plan

Air Quality Monitoring	
Project stage	Pre Construction , Construction & operation period
Parameter	SPM, RPM, SO ₂ , NO _x , CO and Pb
Sampling Method	Use method specified by CPCB for analysis
Standards	Air (Prevention and Control of Pollution) Rules, CPCB, 1994
Frequency	Once before start of work & once every season of the year during construction period & upto 18 months (operation Period)
Duration	Continuous 24 hours / or for 1 full working day
Location	Sensitive locations along the pipe laying work, pumping / lifting station locations, STP site.
Measures	Wherever air pollution parameters increase above specified standards, additional measures as decided by the engineer shall be adopted
Implementation	Contractor through approved monitoring agencies

Supervision	Implementing agency
Water quality Monitoring	
Project stage	Pre Construction & Construction
Parameter	<ul style="list-style-type: none"> pH, BOD, COD, DO, TDS, Pb, Oil & Grease and Detergents for Surface water. Water pH, TDS, Total hardness, Sulphate, Fluorides, Chloride, Fe, Pb for groundwater.
Sampling Method	Grab sample collected from source and analysis as per Standard Methods for Examination of water and Waste water
Standards	Indian standards for Inland Surface Water (IS; 2296, 1982) and for Drinking water (IS; 10500, 1991)
Frequency	Twice a year (pre monsoon and post monsoon seasons) during the construction period
Duration	Once in six month
Location	Locations to represent residential, agricultural, surface water quality and vicinity of the construction site.
Measures	At locations of increased in water pollution, all inflow channels shall be checked for pollution loads and channel delivering higher pollution loads and channel delivering higher pollution load shall be terminated from disposal into the water source and other methods of disposal shall be adopted
Implementation	Contractor through approved monitoring agencies
Supervision	Implementing agency
Noise Level Monitoring	
Project stage	Pre Construction , Construction & operation period (as agreed)
Parameter	Noise level on dB (A) scale noise levels on dB (A) scale
Special guidance	Free field at 1 m from the equipments whose noise level are being determined. Equivalent noise levels using an integrated noise level meter kept at a distance of 15m from edge of pavement
Standards	MoEF Noise Rulers, 2000
Frequency	Once every seasons (except monsoon) for each year of construction
Duration	Reading to be taken at 15 seconds interval for 15

	minutes every hour and then averaged
Location	<ul style="list-style-type: none"> Wherever the contractor decides to locate the equipment yard. At sensitive location such as school, hospitals etc.
Measures	In case of noise levels causing disturbance to the sensitive receptors, management measures as suggested in the EMP shall be carried out.
Implementation	Contractor through approved monitoring agencies
Supervision	Implementing agency
Soil Quality Monitoring	
Project stage	Pre Construction & Construction
Parameter	Monitoring of Pb, SAR and Oil & Grease
Sampling Method	Sample of soil collected by augur method to be acidified and analyzed using spectrophotometer
Standards	Threshold for each contaminated set by IRIS database of USEPA until national standards are promulgated
Frequency	During the pre monsoon post monsoon seasons each year for the entire construction period
Duration	Once in a year
Location	At productive agriculture lands abutting traffic detours, pumping / lifting station locations and STP site.
Measures	At location of increased in pollution levels, source shall be identified and shall be diverted from future disposal
Implementation	Contractor through approved monitoring agencies
Supervision	Implementing agency
STP	Once every week
Health	Identification of water related disease once a year

8.0 COMMAND AREA DEVELOPEMNT

POTENTIAL CREATION & PROPOSED WORK

Sangola LIS comprise of raising main, feeder canals, canal networks of existing in the command area and new canal system for free command area.

The irrigation potential of the project is 6525 hector. As per the guidelines issued vide Govt. circular (Marathi) No. CAD/1089/257/CAD (works) Mantralaya Mumbai Dt. 13.11.90. The work is split up in two parts viz. CAD component as per the project estimate for administrative

approval & CAD component outside the project estimate. The type of works to be included in these two parts, have also been mentioned.

CAD Components

- a. Rotational Water Supply Scheme
- b. The total area for CCA for Scheme is 17876 ha. The provision @ 365/ha resulting estimated to 41 lakhs.
- c. Ground water Exploitation & development
- d. To promote conjunctive use of ground water in the command area, well irrigation is proposed to be encouraged under Integrated Rural Development Program. Estimate
- e. Total CCA – 652 ha 10% area i.e. proposed @ Rs. 125/ha (As per Vishnupur Project) – Total cost = 900×125 Rs. 1.12 lakhs.
- f. for conjunctive use of ground water 580 No. wells are proposed in command area by G.S.D.A. Assuming cost per well as Rs. 50,000 /-
- g. Total cost of wells $580 \times 50,000 = 290$ lakhs
- h. Total provision for I + II = $1.12 + 290 = 291.2$ lakhs

In Maharashtra since 1976 - 77 implementation of Command Area Development and Water Management [CADWM] sponsored by Central plan has taken place with an aim to bridge the wide gap between irrigated potential created and utilized. It enhances target to raise agricultural production with productivity in command area by equal and judicious distribution to all concerned.