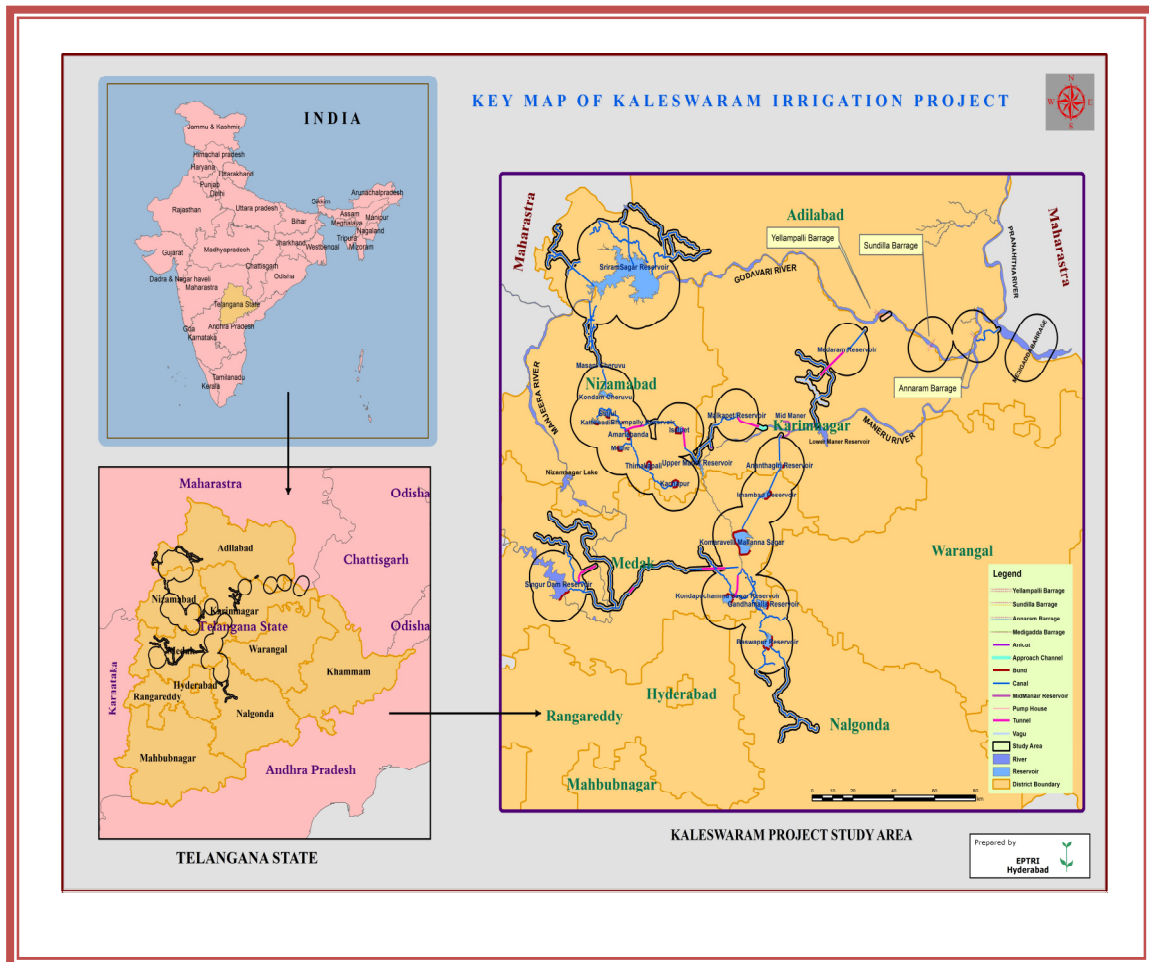


EXECUTIVE SUMMARY FOR THE PROPOSED KALESHWARAM PROJECT



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EXECUTIVE SUMMARY

1 Introduction

Telangana State is situated in the central stretch of the Indian Peninsula on the Deccan Plateau. It is the 29th state of India and twelfth-largest state in the country with an extent of 114,840 square kilometres and a population of 35.3 Millions (2011 census). The region is drained by two major rivers namely Godavari and Krishna. The climate in this region is semi-arid and has skewed distribution of rainfall in space and time necessitating water management for sustainable agriculture, drinking water and other uses. The cultivable area in the State is 75.21 lakh ha and net irrigated area is 22.89 lakh ha (30.43% of cultivable area) only.

There has been a general emphasis in the past on gravity (canal flow) irrigation according to the ground levels of the command area, leaving a large commandable area in middle reaches of Godavari- covering uplands of Telangana State spread over the districts of Nirmal, Kommaram Bheem, Mancherla, Jagityal, Peddapalli, Rajanna Siricilla, Sanga Reddy, Medak, Siddipet, Rangareddy, Nalgonda, Jayashankar Bhupalpalli, Manchiryal, Yadadri – Bhuvanagiri, Bhadrachalam-Kothagudem, Nizambad Khammam- where only lift irrigation is feasible. Most of these areas are drought prone.

The command area proposed under this project is part of the balance command area not covered by any other schemes such as Sri Rama Sagar Project, Flood Flow Canal Project from SRS, Nizam Sagar project, Sripada Yellampalli project and other medium and minor irrigation schemes. The transfer of water through lift schemes and conveying it to water deficient upland regions of Telangana is thus of strategic importance and a pressing need towards a more equitable development of water resources for irrigation and other water requirements. Project is proposed at Medigadda Village, below the point of confluence of Pranahitha and Godavari River about 20 km d/s of Kaleshwaram, where famous Shiva temple, Kaleshwaram, exists. **The project is thus named as Kaleshwaram Project.**

As per the EIA notification, 2006, and its subsequent amendment, the proposed **Kaleshwaram Project** comes under River valley category - schedule 1(c) under “Category A” project as it has more than 10,000 ha of Cultivable Command Area (CCA). The proposed project has the total cultivable command area of 7,38,851 ha (18.25 lakh acres). Expert Appraisal Committee (EAC) of the Ministry of Environment, Forest & Climate Change has accorded Terms of Reference (ToR) on 31st March 2017 vide Ref.No.J-12011/12017-IA-I(R) to carry out the EIA and EMP studies for the project.

1.1 Project Proponent

Irrigation & CAD Department of Telangana State, the project proponent, is making all efforts to harness and utilize the available water resources for the benefit of Agricultural sector, Industrial Sector and providing drinking water for holistic development of the State. The development of Irrigation in Telangana is mostly dependent on Godavari & Krishna Rivers and their tributaries and to some extent on Tanks & Ponds. I&CAD Department is planning

for providing irrigation facilities to one lakh acres in each constituency (other than urban) under different sources to save the agricultural sector from the vagaries of monsoon by the proposed Kaleshwaram Project.

2 Project Description

Kaleswaram Project was formulated for irrigation of 7,38,851 ha in Karimnagar, Rajanna Sircilla, Siddipet, Medak, Yadadri, Nalgonda, Sangareddy, Nizamabad, Jagityal, Kamareddy, Nirmal, Medchal, Jayashankar Bhupalpalli, Manchiryala and Peddapalli districts of Telangana by diverting 180 TMC of water from River Godavari. The source point is near Medigadda Village, below the point of confluence of Pranahitha and Godavari River about 20 km downstream of Kaleshwaram.

As far as the water availability, CWC has assessed that 282 TMC is available at Medigadda site out of which, about 180 TMC is proposed to be lifted for the Kaleshwaram project. The overall water availability for the project- including the self yield of tanks, utilizable groundwater and additional water availability at Yellampally barrage- is about 225 TMC. The project has been formulated & designed after careful planning and realistic approach. The project consists of following components:

- i. Three barrages across River Godavari between Yellampally and Medigadda viz.**
 - Medigadda Barrage on Godavari near Medigadda (Kaleshwaram),
 - Annaram Barrage on Godavari downstream on the confluence of Manair River with Godavari river near Annaram
 - Sundilla Barrage on Godavari downstream of Yellampally barrage near Sundilla.
- ii. Water conveyance system consisting of gravity canals and tunnels.** For this purpose the entire project has been divided into seven links.
- iii. Online storages**

In order to utilize the diverted water of Godavari River and store it en route, 17 online storages have been proposed, which would provide irrigation to a command area of 7,38,851 ha in the entire project.
- iv. Distributory Network System**

It is proposed to provide irrigation facilities to the command area of 7,38,851 ha (18,25,700 acres) covering thirteen districts.

The utilization of 225 TMC out of which 180 TMC is diverted from River Godavari includes - 134.5TMC for Irrigation, 34.5 TMC for stabilization of existing command area, 30 TMC for drinking water to Hyderabad, 10 TMC for drinking water to en route villages and 16 TMC for industrial uses. Thus, apart from providing irrigation facilities to its own command area of 7,38,851 Ha (18,25,700 acres) Kaleshwaram project would also enable to stabilize the existing command area of Sri Ram Sagar Project (SRSP) Stage-I (3,92,008.5 Ha), SRSP Stage-II (1,78,061.7 Ha), Nizam Sagar Project (NSP) (94,829.9 Ha), Singur Project (16,187.4 Ha) and Flood Flow canal (80,937 Ha) totaling to 7,62,024 Ha (18,82,970 acres).



2.1 Environmental sensitivity

Forests/National parks/Sanctuary/Biosphere Reserve

Around 75 reserve forests are located within the study area of the barrages, online storages and along the length of the canal. There no National parks, Sanctuaries and Biospheres within the study area.

Archaeological Monuments

There are no known structures of archaeological importance getting submerged or affected under submergence in the formation of new storage facilities.

Historical Monuments

There are no known historical monuments getting submerged under the project.

Tourism Infrastructure

There are no places of tourist importance coming under submergence or getting affected by the construction of the proposed storage facilities.

2.2 Hydrology

The proposed Medigadda barrage is located above the confluence of River Indravati and Godavari. The hydrological studies are done by the method of decomposition and re-composition on the basis of the location of hydrological observation station maintained by CWC on the main Godavari River and its tributaries.

Estimation of Design flood

The design floods values for the structures proposed at Medigadda (225652 sq.km), Sundilla (1,03,482 sq.km) and Annaram (1,17,535, sq.km) has been estimated by resorting to flood frequency approach utilizing the annual peak flow data of CWC sites namely Koida, Pathagudem, Mancherla, Perur and Polavaram. The design flood at Kaleshwaram barrage is estimated as 72,546 cumecs. However, for design of the barrage 80,000 cumecs has been considered.

2.3 Geology of Study Area

The geological formations indicate Gondwana Super Group of Talchir formations with double bed and sandstone. The Gondwana are exposed in the eastern most part with Sullavai mostly occupying the central portion. The granites are present to the west. The Pakhel and the Penganga formations are sand-witched in between. A number of faults have been deciphered in the area, out of which some are regional faults.

2.4 Seismic zone

The location of the Project, as per its coordinates with respect to the Seismological Zonation, is almost at the border of Zone II and Zone III. With the Project being an important one, it is considered to be located in Zone III, even though it on the fringe of the Zone.

2.5 Drainage

Due to the proposed project, there will be recharging to the groundwater that may create water logging and drainage problem in the command area. Therefore, it is suggested that conjunctive use of the ground water may be encouraged in the command area. While making irrigation planning in the present project, cropping pattern and water allowance will be formulated in such a manner that there would be no excessive groundwater recharge due to the introduction of irrigation.

2.6 Power

The power requirement at each substation varies from 0.45 MW to 973 MW. The total power required for the project is about 4627.24 MW. The pump house requires power supply at various voltages ranging from 33 KV to 765 KV. The power supply to the various lift points is to be availed from the respective power supply authorities (TSTRANSCO for supply 132 KV voltage and DISCOM below 33 KV).

2.7 Water Availability

The water availability assessment for Kaleshwaram project has been carried out by combining the flow series of Pranahitha sub-basin, Maner sub-basin and Middle Godavari up to the confluence of Pranahitha River.

Water availability calculations

Sl. No.	Particulars	Pranahitha Sub basin	Middle Godavari Sub basin	Maner sub basin	Total Kaleshwaram Project*
	CA (Sq. Km)	61819	103,667	13106.0	-
A.	Gross Availability				
1.	at 75% Dependability (In MCM)	5532	3359	527.2	11736
2.	at 75% Dependability (In TMC)	195	119	18.6	415
B.	Utilization				
1.	Ongoing Projects	-	1806.3	3.9	1810.2
2.	Future Projects	-	1927.9	4.4	1932.3
3.	Sub Total (MCM)	-	3734.2	8.3	3742.5
4.	Sub Total (TMC)	-	131.9	0.3	132.2
C.	Net Water Availability for Kaleshwaram Project				
1.	Net Availability (MCM)	5532	-	518.9	7993.5
2.	Net Availability (TMC)	195	-	18.3	282.3
* - Figure arrived here is 75% dependable value determined based on month to month addition of every year.					

2.8 Project Cost Estimation

The project cost estimation with the components of Irrigation, Drinking water to en-route villages, Drinking water to Hyderabad city and water for industrial use works out to Rs.80, 499.71 Crores.

2.9 Benefit –Cost Ratio

The project being a multi-Purpose project, the proportionate cost of project with Irrigation demand and drinking water supply to en route villages in worked out on proportionate utilization of water quantity. The Benefit cost ratio worked out to 1.55.

3 Environmental Baseline study

3.1 Meteorology

Monsoon generally extends from June to September. Maximum and minimum temperature was found to be 41.3 and 9.5 °C at Adilabad station. On an average the maximum relative humidity was found at Hanamkonda in the month of July where as minimum humidity was observed at Ramagundam in the month of May. The meteorological data at Ramagundam indicates that the predominant wind directions are from North East, South East followed by South west. The frequency of calms varies up to 29.9 %. The highest annual rainfall of 1607 mm was recorded in the year 2013 at Adilabad station, and lowest annual rainfall of 509 mm in the year 2015 at Medak station.

3.2 Air Environment

The ambient air quality was carried out for 10 sampling stations. The average results were compared with ambient air quality standards were found to be well within the limits. PM₁₀ concentrations range from 46.0 to 97.0 µg/m³, minimum concentrations was observed at Kannala Village, and maximum at Janagaon. PM_{2.5} concentrations were in the range from 20.8 to 59.2 µg/m³. The minimum concentration was observed at Kannala Village and maximum at Janagaon village. SO₂ and NO₂ concentrations are in the range from 9.1 to 24.4 µg/m³ and 11.7 to 32.3 µg/m³. The minimum concentration for SO₂ and NO₂ was observed at Kannala Village, and the maximum concentration for SO₂ and NO₂ were observed at Gunjapadugu respectively. All the secondary ambient air quality results are found to be well within the National Ambient Air Quality Standards (NAAQS).

3.3 Noise Quality Levels

Maximum value of Leq Day is 51.2 dB(A) at Janagaon Village, and minimum is 42.3 dB(A) at Sector II Township. Maximum value of Leq Night is 41 dB(A) at Janagaon Village, and minimum is 34.4 dB(A) at Sector II Township. From the secondary data, it is seen that the noise levels in terms of Leq (day) and Leq (night) are well within the standards stipulated at all the location.

3.4 Surface Water Quality

pH values were found to be in the range between 7.0 to 8.1. Colour, Nitrates, TSS, chlorides concentrations were well within the tolerance limits.

Total coliforms and fecal coliforms were present in all the surface water samples. *E. Coli* was present in all the surface water samples. The presence of coli forms indicates that the contamination might be due to the runoff water with bacteria in soil or sewage. Fecal coli forms and *E. Coli* presence might be due to animal droppings or human fecal contamination.

3.5 Ground water quality

The analysis results of groundwater samples were compared with IS:10500 of Acceptable and Permissible limits, which are stipulated for water to be fit for drinking purpose with groundwater as source. The results along with the Acceptable and Permissible limits of various parameters as per the IS: 10500, 2012 standards.

pH values were in the range between 6.0 to 7.9 in the groundwater samples. The turbidity values were well within the permissible limits. The total alkalinity concentrations in the samples were below the permissible limit of 600 mg/L except the sample Medpalli village and Narsingapuram (604 mg/l).

The TDS concentration was observed to be below the permissible limit of 2000 mg/L for all the locations. The total hardness concentration was observed to be within the permissible limit of 600 mg/L for all the locations except for the sample at Gunjapadugu Village, 880 mg/L) Medpalli village (1140 mg/L), Sector-2 (1470 & 1800 mg/L) and Peddampet village (990 & 806 mg/L). The calcium concentration at all the locations were below the permissible limits of 200 mg/L and the magnesium concentration is above 100 mg/L at Gunjapadugu Village (118 mg/L), Sector-2 (232 & 151 mg/L). The Magnesium concentration for all the locations were below the permissible limit of 100 mg/L, except Medpalli village (205 mg/L) and Sector-2 (216 mg/L).

The nitrates concentration in all the groundwater samples observed to be below the permissible limit of 45 mg/L except at Gunjapadugu Village (64 mg/L), Asand (47 mg/L) and Narsingapuram (57 mg/L). The sulphates concentration in all the groundwater samples observed to be below the permissible limit of 400 mg/L. The fluoride concentration in all the groundwater samples observed to be well within the permissible limit of 1.5 mg/L. Cyanide, Anionic detergents, Hexavalent Chromium, Boron, and Mineral Oil were below their detectable limits.

The concentration of iron (as Fe), is above the permissible limit of 0.3 mg/L at Rachapalli Village (0.37 mg/L).

The concentrations of heavy metals Cadmium (Cd), Manganese (as Mn), Copper (Cu), Lead (Pb), Zinc (as Zn), Selenium (as Se), Arsenic (as As), Chromium (Cr), Nickel (Ni) and Aluminum (as Al) were either below the detection limits or below the permissible limits.

3.6 Hydrology

The Medigadda barrage (near Kaleshwaram) is proposed at Medigadda village on River Godavari. The proposed FRL of Medigadda reservoirs about 100.0m with a capacity of 16.17 TMC. In the 10Km buffer area from the proposed barrage location separated by River Godavari, 50% of the area is a part of Jayasankar Bhupalpally District and remaining 50% is a part of Gadchiroli district of Maharashtra State. Annaram and Sundilla barrages are

proposed in addition to Medigadda barrage for the purpose of lifting required quantum of water from Godavari River.

3.7 Soil quality

pH is an important parameter which indicates the alkaline or acidic nature of soil. Soils collected from the villages in the study area are slightly alkaline to moderately alkaline in nature having pH in the range of 7.6 to 7.9.

The EC for the soil samples are in the range of 0.094-0.147 mmhos/cm. cation exchange capacity which was found to be in the range of 17.5 to 61 meq%.

The Nitrogen value ranged from 88 to 163 kg ha⁻¹ reflecting that the values are observed to be in better category. The minimum value was observed at Kannala Village and the maximum value was observed at Mulkalapalli. The Phosphorus value ranged from 1.17 to 6.10 kg ha⁻¹ indicating that the values varied from very less category. The maximum value of 6.10 kg ha⁻¹ was found at Kannala Village and the minimum value of 1.17 kg ha⁻¹ at GDK-10 Incline. The Potassium value ranged from 267 to 583 kg ha⁻¹ indicating that values are observed to average to more than sufficient category. The maximum value was found at Gunjapadugu Village and the minimum value was observed at GDK-10 Incline village.

3.8 Land use and Land cover

Link wise land use and land cover is given below

Link wise spatial distribution and extent of Land Use/Land Cover Classes in the study area

Land use mapping unit	Area in Ha					
	Link 2	Link 3	Link 4	Link 5	Link 6	Link 7
Built Up	906.37	438.24	4332.92	1006.66	884.69	7756.46
Kharif crop land	1313.03	13935.19	84548.70	12195.93	11474.42	71499.12
Rabi Crop Land	250.29	0	1871.71	0	20306.15	11119.00
Zaid crop land	0	0	0	0	19.03	1849.67
Double Crop Land	23047.71	7199.24	63277.37	9118.54	6020.38	139319.98
Agricultural Fallow	90.17	997.49	24068.54	19346.51	12122.37	28563.03
Agricultural Plantation	277.57	0	1716.43	396.14	0	543.28
Quarry	22.66	109.09	966.14	527.25	0	433.37
Mining area	18.38	39.27	124.28	0	0	73.43
Industrial area	2491.88	0	265.93	66.18	0	48.84
Dense Forest	314.32	5236.66	279.80		695.08	17599.73
Open Forest	165.70	1479.99	6911.15	33.39	1227.44	38231.05
Scrub Forest	0	1362.63	5465.53	1301.67	356.60	20797.02
Forest plantation	0.07	0	1787.61	0	0	81.90
Tree plantation	143.65	1151.6	1651.29	234.43	0	3076.71
Barren Rocky/Stony waste	4315.86	47.43	1312.33	641.42	467.68	2166.42
Dense scrub	2590.45	649.62	16289.02	6255.99	0	16612.92
Open scrub	0	2453.40	9170.84	981.05	0	20600.82

Land use mapping unit	Area in Ha					
	Link 2	Link 3	Link 4	Link 5	Link 6	Link 7
Gullied and ravenous land	1493.63	68.65	9.35	0	0	1081.62
Salt affected lands	0	0	44.21	63.51	0	0
Water bodies/Reservoir/ Tanks/River/Stream	0	1871.29	7825.13	1847.17	12355	53510.5

3.9 Ecology studies

The available vegetation is basically of dry deciduous forest and scrub jungle type as per revised forest types classification of India by Champion and Seth. A total of 212 plant species belonging to 174 genera and 57 families were recorded in the study area.

The family Leguminosae is the most dominant family with 39 species followed by Compositae (16 species), Malvaceae (12), Poaceae (12), Apocynaceae (10), Phyllanthaceae (9), Rubiaceae (9), Combretaceae (7), Convolvulaceae (7), Lamiaceae (7), Acanthaceae (6) and Moraceae with 6 species. Twenty four families were represented by one species each, 12 families were represented by 2 species each, 6 families were represented by 3 species each and 3 families were represented by 4 species each. The flora in the study area consists of 76 trees, 35 shrubs, 4 lianas, 19 climbers, 77 herbs and one is epiphyte.

3.9.1 Floral Diversity

There are two important indices to denote the dominance for Simpson's Index values of 0.046 for trees and diversity for Shannon Wiener Index value of -1.410 for trees. This average uncertainty increases as the number of species increases and as the distribution of individuals among the species becomes even.

3.9.2 Faunal Studies

The fauna consist of mostly 'common' and 'generalist' species and none of the species is threatened globally as per the IUCN Red List 2012.

15 species of Butterflies, five (4) species of Odonates and three (3) species each of amphibians and spiders were recorded during the study period. None of the species is threatened globally as per IUCN Red List 2012 or Wildlife Protection Act [WPA].

A total of 41 species of birds were recorded in and around the study area. Among them *Phalacrocorax fuscicollis*, *Ardea modesta*, *Ardeola grayii*, *Bubulcus ibis*, *Ardea cinerea*, *Anas poecilorhyncha*, *Coturnix coturnix*, *Centropus bengalensis*, *Tyto alba*, *Halcyon smyrnensis*, *Dicrurus macrocercus*, *Pycnonotus cafer* and *Pycnonotus jocosus* are under Schedule-IV and *Corvus splendens* is under Schedule-V of the WPA.

A total of 6 species of Reptiles were recorded, among them *Daboia russelii* is under Schedule II of the Wildlife Protection Act [WPA] 197 Out of 6 species of mammals recorded in and around project site, species, namely, *Macaca mulatta is* under Schedule-II. *Sus*



scrofa cristatus and *Axis axis* are under schedule-III. *Funambus palmarum* is under schedule IV and *Mus booduga* is under schedule V.

3.9.3 Aquatic Ecology

Fishes & breeds in the region & Fish catch data at Godavari river are *Amblypharyngodon mola*, *Catla catla*, *Channa marulius*, *Channa striata*, *Cirrhinus cirrhosus*, *Clarias dussumieri*, *Cyprinus carpi*, *Glossogobius giuris*, *Heteropneustes fossilis*, *Labeo bata*, *Labeo calbasu*, *Labeo fimbriatus*, *Labeo rohita*, *Mystus sps*, *Notopterus notopterus*, *Ompok bimaculatus*, *Oreochromis mossambicus*, *Puntius sophore*, *Puntius ticto*, *Anguilla sps*, *Salmostoma sps*, *Wallago attu*, *Macrobrachium malcolmsonii*, *Macrobrachium rosenbergii* etc.

3.10 Socio-economic

In the study area, as many as 58 percent were found to be illiterate and 42 percent were literate. Among the literate group, 26 percent were males and 16 percent were females.

In the study area, the proportion of farm households belonging to different occupation groups, it was observed that 'farming' was the major occupation of the sample households and it constitutes about 83% and agricultural labourers constitute about 20%, 'Govt. service' Constitutes about 4%, 'trade & business' 5% and engagement in other activities 4%.

With regard to the different subsidiary occupation groups, majority of the sample households (83%) were found to be engaged in animal husbandry & dairying, about 4% in poultry and about 5% in fisheries. In the study area, as many as 58 percent were found to be illiterate and 42 percent were literate. Among the literate group, 26 percent were males and 16 percent were females.

4 Anticipated Impacts

The construction of the barrage will have vast implication, both positive and negative. The effect due to construction phase is however temporary in nature and, therefore, has no permanent effect on environment.

The construction equipment and DG Sets need diesel as fuel. The major pollutants which are emitted as a result of fuel combustion are SO₂, NO_x and SPM. The gaseous emissions from vehicles, DG sets and oil engines will cause for minor increase in gaseous pollutants at the project sites. Hence these would have some temporary impacts on the ambient air quality in the area, though these are not anticipated to be high.

During the construction phase, the oil/lubricants used for DG sets and other equipments will be collected in leak proof drums / barrels. The same shall be sent for reuse or disposed as per the norms of TSPCB - Hazardous Waste Management Rules).

Hazardous waste like used oil generated from the equipments used during the construction stage of the project shall be collected and stored in leak-proof drums/ barrels. Thus the collected oil spillage or hazardous materials need to be sent to authorized re-processors or disposed as per the TSPCB guidelines.

Any water resources development project, submerges land and property, displaces people, change the flow regime of rivers / streams, has an impact on the local flora and fauna and in extreme cases induce natural phenomena not observed earlier (such as Earthquake). The project must be planned and implement to ensure. Water resources development is a must, to meet the water, food and energy needs of the ever-increasing population, control floods and droughts to avoid loss of life and properties and enhance the environmental conditions to provide better standards of living.

The water holding capacity of the soils of the command area is low to medium and the water table levels in the command area on an average is well below the ground surface, there is no need to take any special efforts to lower down the sub-soil water table in the areas under normal conditions. Ground water found in these areas is free from salinity problems.

The ground water table is expected to rise, due to the barrage impoundment in the submerged area. The ground water regime in the canal alignment would generally remain unaffected as the canal is proposed to be wholly lined with cement concrete. However, the ground water regime in the command areas of the link canal project would increase due to the application of irrigation water, in due course of time. Action may be taken to promote conjunctive use of water along with the adequate selection of cropping patterns for the region.

One major beneficial impact upstream of the barrage is the added biomass, enhanced water availability, income, and ecological security, and restored micro-climatic conditions for local communities from the restoration of degraded catchments. Cultural heritage sites do not exist in the study area, thus not affected by submergence.

The project does not involve use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the (flora, fauna, and water environment. Thus, No harmful materials which cause harm to human health or the environment will be used, stored, transported and handled

No adverse cumulative impact due to the other existing or planned activities such a supporting infrastructure (roads, power supply, waste or wastewater treatment, etc.) extractive industries, supply industries, housing development, others envisaged in the region.

5 Project Benefits

Benefits from the project includes increased agriculture yield, increase in crop intensity, increase in crop area, crop diversification, more commercial fish production, increased employment outside agriculture from increased crop output in related industries such as input industry (backward linkages) and output processing industries (forward linkages), increased farm forestry and vegetation in irrigated areas. This should create beneficial impact on wildlife, flora & fauna, assurance of food security and poverty eradication, transfer of technology, health and nutrition.

6 Environmental Management Plan

The Environmental Management Plan (EMP) is a site specific plan developed to ensure that the project is implemented in an environmental sustainable manner where all contractors



and subcontractors, including consultants, understand the potential environmental risks arising from the proposed project and take appropriate actions to properly manage that risk. EMP also ensures that the project implementation is carried out in accordance with the design by taking appropriate mitigative actions to reduce adverse environmental impacts during its life cycle. The plan outlines existing and potential problems that may adversely impact the environment and recommends corrective measures where required.

The EMP includes Command Area Development Plan, Soil erosion, Biodiversity and wildlife Conservation & Management plan, Resettlement & Rehabilitation, Green Belt Development Plan, Fisheries Conservation Management Plan, Reservoir Rim treatment plan, Reservoir Rim treatment plan, Plan for restoration of Quarry sites, Water, Air and noise management plan, Public health delivery plan, Solid waste Management plan, Environment safe guards during construction activities including road construction, Energy conservations, Compensatory afforestation plan and Local Area development plan.

Conclusion

EIA and EMP study that was carried out for Kaleshwaram project shows that environmental secondary data collected within 10 kms radius of the project site of air, noise, surface water, ground water, soil quality of the region are well within the prescribed standards of the competent authority. The flora and fauna study indicates that there are no rare and threatened flora and fauna in the project site; however the local flora and fauna may also be conserved.

The project increases the agriculture yield, increases crop intensity, increase crop area, crop diversification, more commercial fish production, increased employment outside agriculture from increased crop output in related industries such as input industry and output processing industries and vegetation in irrigated areas. This would create beneficial impact on wildlife, flora & fauna, assurance of food security and poverty eradication.

If proponent follows the rules, amendments and notifications given by MoEF&CC/CPCB then the environment will not be affected and have benefit for the surrounding areas.