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# Assessment on Soil and Socio-Environmental Impact for Godavari Bio-Refineries Distillery Unit

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***Abstract: Godavari Bio processing plants Ltd. (GBL) arranged at Sameerwadi, Dist. Bagalkot, Karnataka is a mechanical complex with a sugar manufacturing plant of 7,500 TCD and refinery of 200 KLPD dependent on Alfa Laval consistent maturation innovation which is to be extended to 320 KLPD dependent on ceaseless aging innovation. It is likewise proposed to extend the current ENA plant limit of 40 KLPD to 260 KLPD. The extension of the refinery from 200 KLPD to 320 KLPD would primarily utilize Grains/Cassava/Beet/Sugarcane juice/Sweet Sorghum as crude materials. The sugar industrial facility of Godavari Biorefineries Ltd., which has 7,500 TCD is being extended to 15,000 TCD without further ado. The unit likewise has a current Co-Generation Unit of 24 MW which is being extended to 64 MW limit. Taking into account this an investigation is taken up considering Godavari Bio processing plants Ltd, Sameervadi, Bagalkot region, Karnataka. The goal of the examination is to investigate the current status of climate in and around the processing plant, and furthermore to anticipate the adjustments in the ecological quality because of the current refinery. The impact study on soil and socio Environment is done.***

## I. INTRODUCTION

### *A. Environmental Impact Assessment*

The concept of environmental protection and resource management has traditionally been given due emphasis and woven in all facets of life in India. These age-old practices teach people to live in perfect harmony with nature.

Nevertheless, changing life styles, increasing pace of urbanization, industrialization and infrastructure development have caused environmental pollution and degradation. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers.

(EIA) is an exercise that aims to identify, predict, interpret and communicate the impact of legislative proposals, policies, programmes, projects and operational procedures on the natural environment and human health and well being. It intends to improve decision-making and ensure environmentally and socially sound and sustainable development.

In view of this a study is taken up considering Godavari Bio refineries Ltd, Sameervadi, Bagalkot district, Karnataka. The objective of the study is to analyse the present status of environment in and around the factory, and also to predict the changes in the environmental quality due to the existing distillery. The effect on environmental air, water, soil and socio economic condition is to be done.

## II. SOIL ENVIRONMENT

The terrain of the study area is plane consisting of black cotton and red loomy soils. The details of land pattern and soil quality of the study area are given below.

### *A. Land Use*

The land use classification of the area falling in 10 Km radius of project site is collected from the 1991 district census handbook. It can be seen that the area is vastly dominated by agriculture land followed by area not available cultivation and land is rain feed agricultural land. The present land utilization data is collected from Assistant Director of Agriculture, it indicates that 75% of the land area is covered with agriculture land and 25% of the area is under non cultivation including roads residential areas and other infrastructure facilities.

### *B. Soil Quality*

Soil samples were collected from different locations of the region of the study area and analysed for physical and chemical parameters as per standards methods.

The result of the soil quality analyses are given in table . The soil is good in nutritional status with high content of organic matter, moderate amounts of nitrogen, potassium and phosphorous content.

The soil type and classification data were obtained from University of Agricultural science for the study reason (Annexure-4). The data is in agreement with the observed soil quality. The soil contains black cotton type and loom to sandy clay-loom in structure. They are dominated with kaolinite clay minerals. Due to porous nature of these soils, salts seen to have washed away from the soil profiles.

The data of sol quality for 200 KLPD at 6 different locations are listed in the table . These are the observed values with respect to 200 KLPD.

Table1 Soil Quality data for 200 KLPD

| S No | Location | 1 | 2 | 3 | 4 | 5 | Mean of 3,4,5 | 6 |
|---|---|---|---|---|---|---|---|---|
| | Distance in Km from Proposed Site | 0 | 4 | 5 | 5 | 5 | 5 | 5.2 |
| 1 | pH | 7.4 | 7.3 | 7.3 | 7.1 | 7.4 | 7.26 | 7.2 |
| 2 | Conductivity µmhos/cm | 340 | 340 | 360 | 399 | 320 | 360 | 407 |
| 3 | Alkalinity as $CaCO_3$% | 0.058 | 0.051 | 0.054 | 0.073 | 0.052 | 0.059 | 0.059 |
| 4 | Chloride % | 0.005 | 0.005 | 0.006 | 0.006 | 0.004 | 0.0055 | 0.056 |
| 5 | Sulphates % | 0.00025 | 0.00028 | 0.00029 | 0.00030 | 0.00022 | 0.00027 | 0.00010 |
| 6 | Nitrates % | 0.25 | 0.30 | 0.32 | 0.38 | 0.22 | 0.31 | 0.40 |
| 7 | Nitrogen% | 0.040 | 0.040 | 0.040 | 0.041 | 0.039 | 0.04 | 0.040 |
| 8 | Phosphorus% | 0.04 | 0.04 | 0.029 | 0.053 | 0.040 | 0.041 | 0.042 |
| 9 | Calcium % | 0.001 | 0.0015 | 0.0018 | 0.009 | 0.001 | 0.003 | 0.007 |
| 10 | Potassium % | 0.93 | 0.96 | 0.98 | 1.30 | 0.92 | 1.06 | 1.12 |
| 11 | Water Holding Capacity | 12 | 11.2 | 12.2 | 10.2 | 10 | 10.8 | 10.5 |

Using data of table 1 Soil quality parameters are evaluated for 320 KLPD and listed n table 2

Parameter Value for 320 KLPD= 1.6*Actual Average Parameter Value for 200 KLPD

Table 2 Estimated Soil Quality parameters for 320 KLPD

| Sr No | Location | 1 | 2 | 3 | 4 | 5 | Mean of 3,4,5 | 6 |
|---|---|---|---|---|---|---|---|---|
| | Distance in Km from Proposed Site | 0 | 4 | 5 | 5 | 5 | 5 | 5.2 |
| 1 | pH | 11.8 | 11.68 | 11.6 | 11.3 | 4.8 | 11.61 | 11.5 |
| 2 | Conductivity | 544 | 544 | 576 | 638 | 512 | 576 | 651.2 |
| 3 | Alkalinity % | 0.0928 | 0.0916 | 0.0864 | 0.1168 | 0.083 | 0.094 | 0.094 |
| 4 | Chloride % | 0.008 | 0.008 | 0.0096 | 0.0096 | 0.0064 | 0.0088 | 0.00896 |
| 5 | Sulphates % | 0.0004 | 0.000448 | 0.000464 | 0.00048 | 0.00035 | 0.000432 | 0.00016 |
| 6 | Nitrates % | 0.4 | 0.48 | 0.512 | 0.608 | 0.352 | 0.496 | 0.64 |
| 7 | Nitrogen% | 0.064 | 0.064 | 0.064 | 0.0656 | 0.0624 | 0.064 | 0.064 |
| 8 | Phosphorus% | 0.064 | 0.064 | 0.046 | 0.084 | 0.064 | 0.0656 | 0.0672 |
| 9 | Calcium % | 0.0016 | 0.0024 | 0.0028 | 0.014 | 0.0016 | 0.0048 | 0.011 |
| 10 | Potassium % | 1.48 | 1.53 | 1.56 | 2.08 | 1.47 | 1.69 | 1.79 |
| 11 | Water Holding Capacity | 19.2 | 17.9 | 19.5 | 16.32 | 16 | 17.28 | 16.8 |

The graphs of soil quality parameters for different locations of 200 KLPD and 320 KLPD plant are plotted in figures .

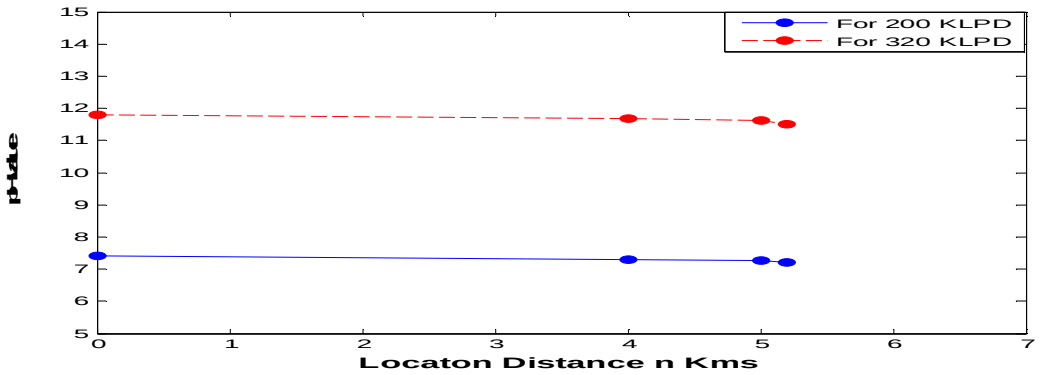


Fig 1 pH Versus Distance curves for 200 KLPD & 320 KLPD

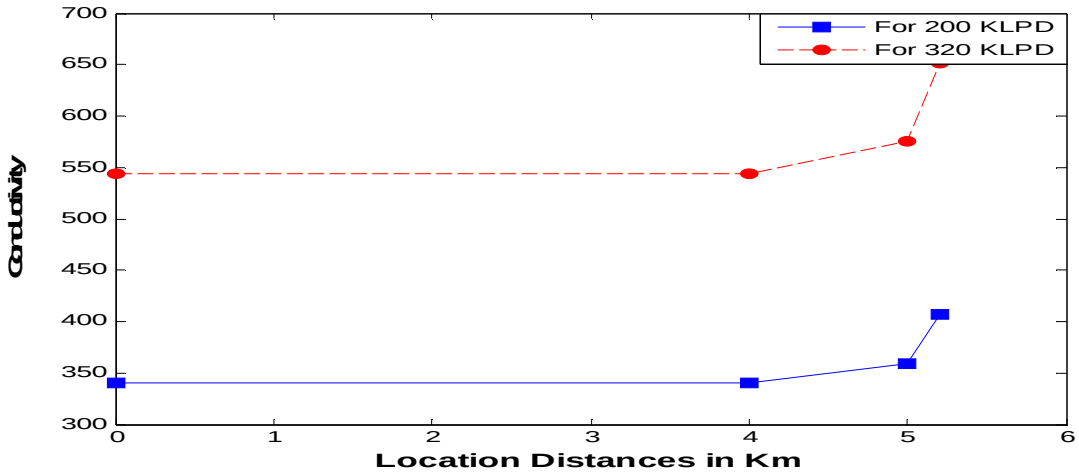


Fig 2 Conductivity Versus Distance curves for 200 KLPD & 320 KLPD

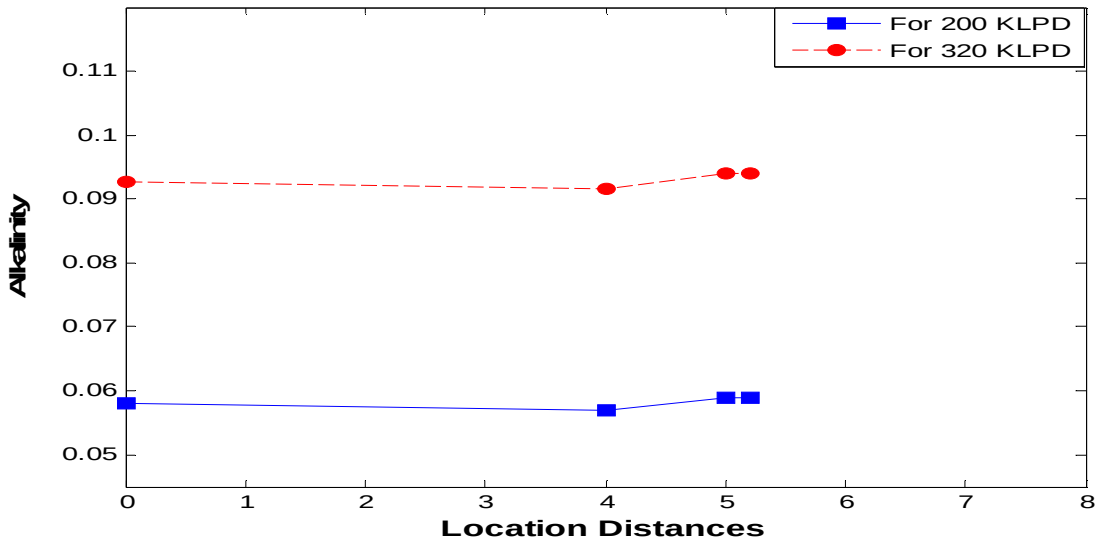


Fig 3 Alkalinity Versus Distance curves for 200 KLPD & 320 KLPD

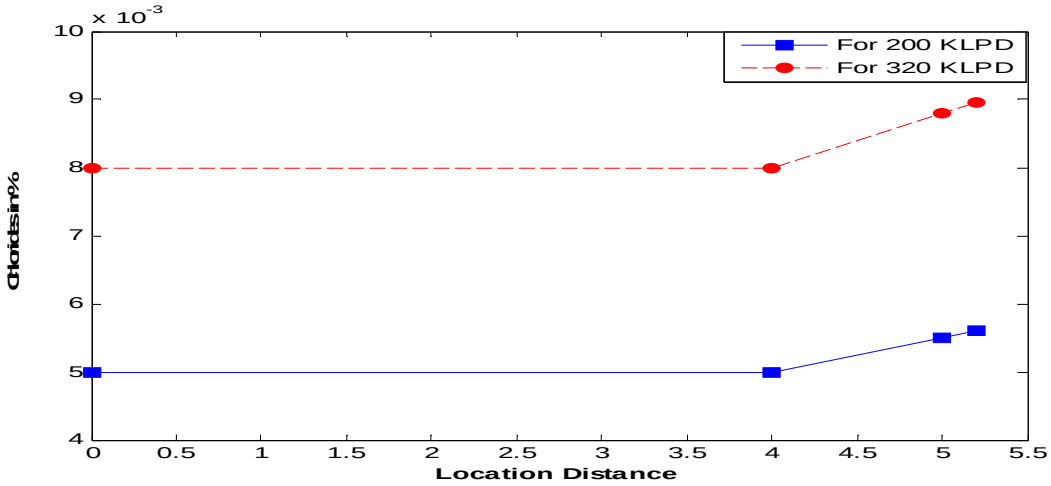


Fig 4 Chloride Versus Distance curves for 200 KLPD & 320 KLPD

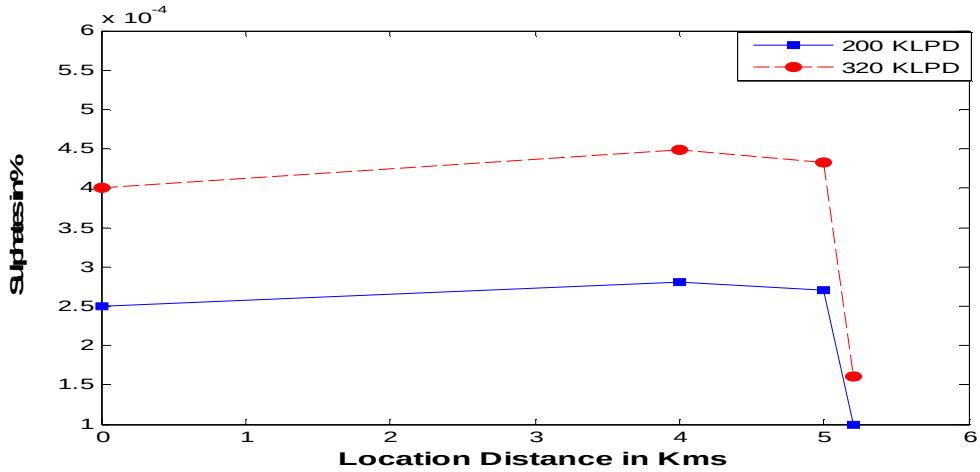


Fig 5 Sulphate Versus Distance curves for 200 KLPD & 320 KLPD

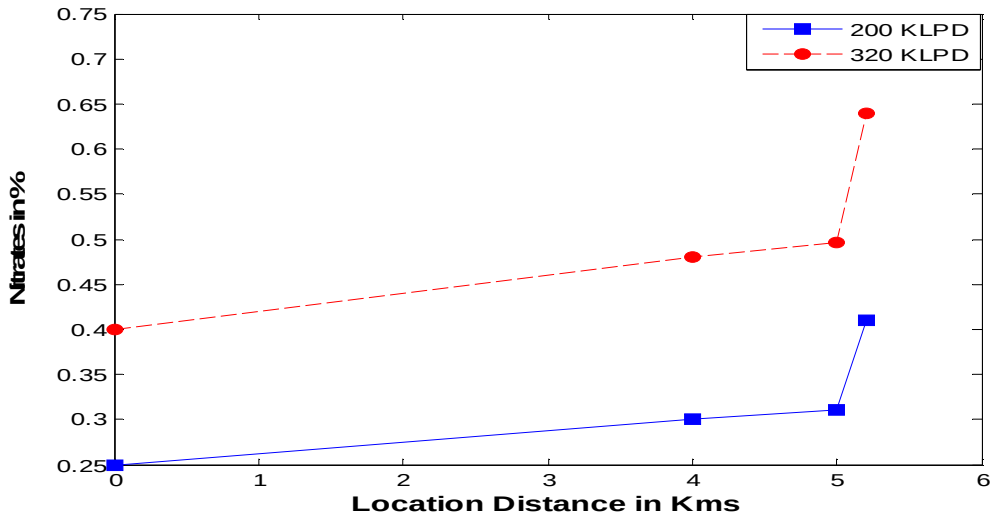


Fig 6 Nitrates Versus Distance curves for 200 KLPD & 320 KLPD

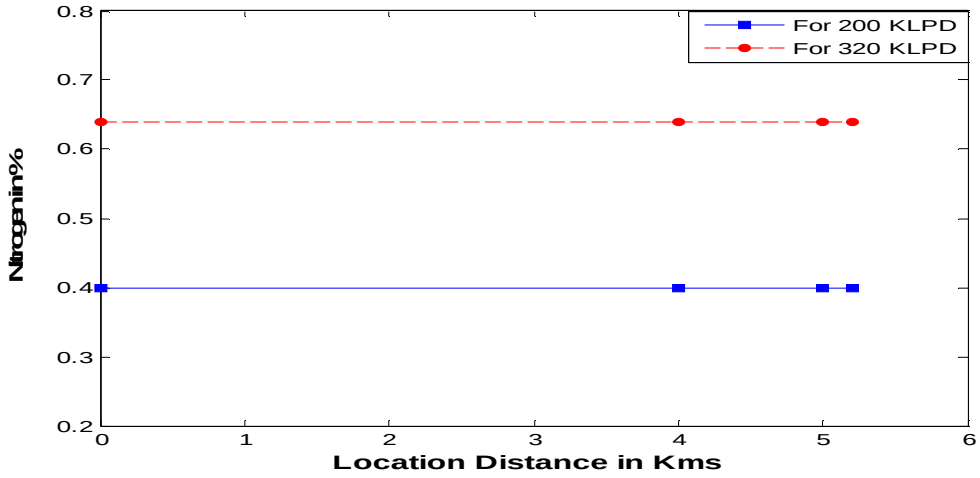


Fig 7 Nitrates Versus Distance curves for 200 KLPD & 320 KLPD

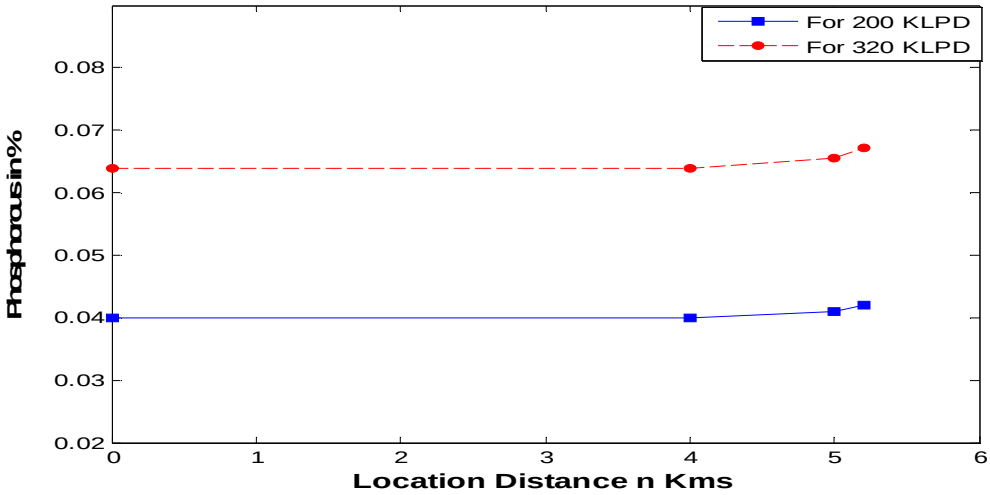


Fig 8 Phosphorous Versus Distance curves for 200 KLPD & 320 KLPD

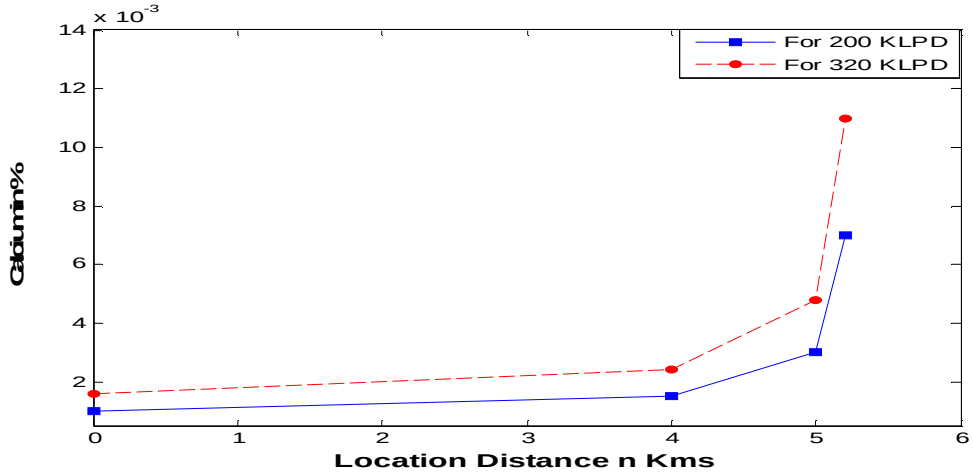


Fig 9 Calcium Versus Distance curves for 200 KLPD & 320 KLPD

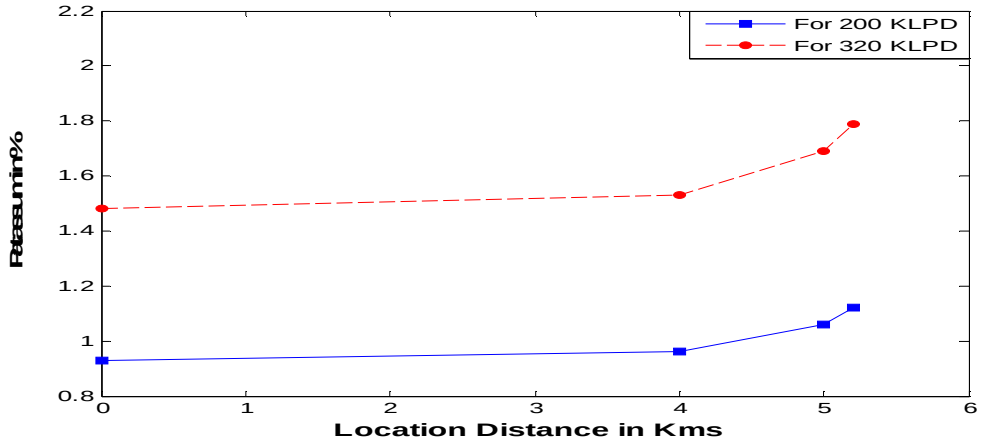


Fig 10 Potassium Versus Distance curves for 200 KLPD & 320 KLPD

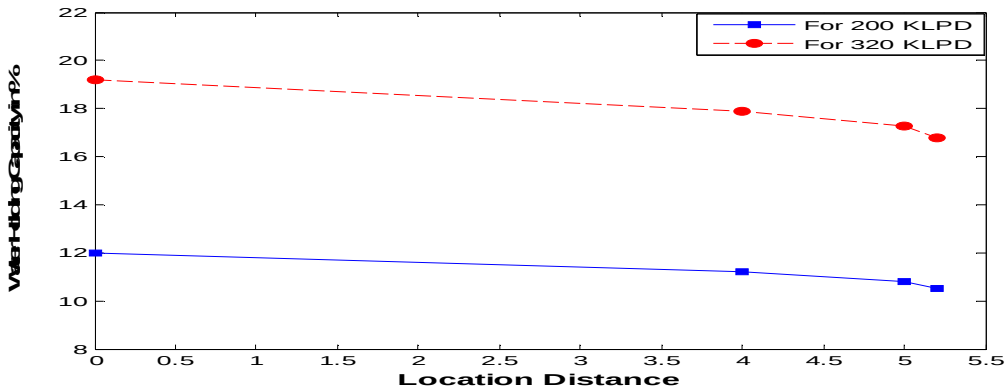


Fig 11 Water Holding Capacity Versus Distance curves for 200 KLPD & 320 KLPD

From these graphs it is observed that soil quality parameters for 200 KLPD and 320 KLPD are within the limits of standards.

## III. SOCIO ECONOMIC ENVIRONMENT

Socio economic impacts as a result of sugar factory and distillery in nearby areas is expected to be on moderate site in terms of employment, housing education, medical transport facilities, economic status, health and agriculture. There is no historical, biosphere reserve, defense installation of national importance in 10 km radius therefore no adverse impact on the same is envisaged. The impacts of the project would be felt in an integrated manner on the socio-economic environment in the study area. The impacts on the different components viz employment, housing, educational, and medical and transport facilities, fuel availability, economics, status, health agriculture is moderately significant. Though size of project is small, but it will generate direct and indirect employment in the area.The environmental department is in regular touch with local surrounding villages to monitor the implementation of various developmental schemes made by the project authority. They will also consider any immediate requirement, which could be taken care of in near future.

Social welfare activities shall be taken up on a large scale. The social welfare activities can be planned in the following areas:

*1)* Medical assistance;
*2)* Primary education;
*3)* Animal husbandry;
*4)* Rural water supply;
*5)* Agricultural improvement;
*6)* Vocational training; and
*7)* Assistance in utilizing government programs.

The following activities can be implemented in each of these areas:

*A. Medical Assistance*

*1)* Providing better medical care to local people by extending them the hospital facilities or first aid facilities;

*a)* Regular immunization programs;

*b)* Medical assistance including provision of ambulance in emergencies;

*c)* Periodic specialist camps

*B. Education*

*1)* Institution of scholarship and prizes;

*2)* Supporting adult education programs.

*C. Vocational Training*

Orientation programs for self-employment in collaboration with District Industries Center and Rural Development Agencies.

*D. Agricultural Improvement*

*1)* Organize with the help of Agricultural Department, training programs for farmers in relevant areas such as pisciculture, animal husbandry, dairy development, modern cultivation, scientific storage of grain, water conservation etc;

*2)* Arrange supply of high yielding variety of seeds together with subsidy or interest free loan for their purchases; and

*3)* Arrange if necessary, for soil testing and technical inputs for increasing yield.

*E. Assistance in Utilizing Government Programs*

Collecting and disseminating information pertaining to various government schemes and providing guidance and assistance to eligible persons for making good use of these schemes.

*F. Employment*

Preference shall be given to local population while inducting the new manpower.

## V.CONCLUSIONS

In the present study no significant adverse change in the quality of the soil was observed. The study is being extended for 320 KLPD plant and the analyses reveals that air quality parameters are within the limits of standards. Water quality analyses show the water hardness 1.6 times more than the hardness for 200 KLPD plant. Soil quality has no significant affect.The study shows that the plant capacity can be extended from 200 KLPD to 320 KLPD without any adverse affect on the environment. The work is carried out in Matlab.

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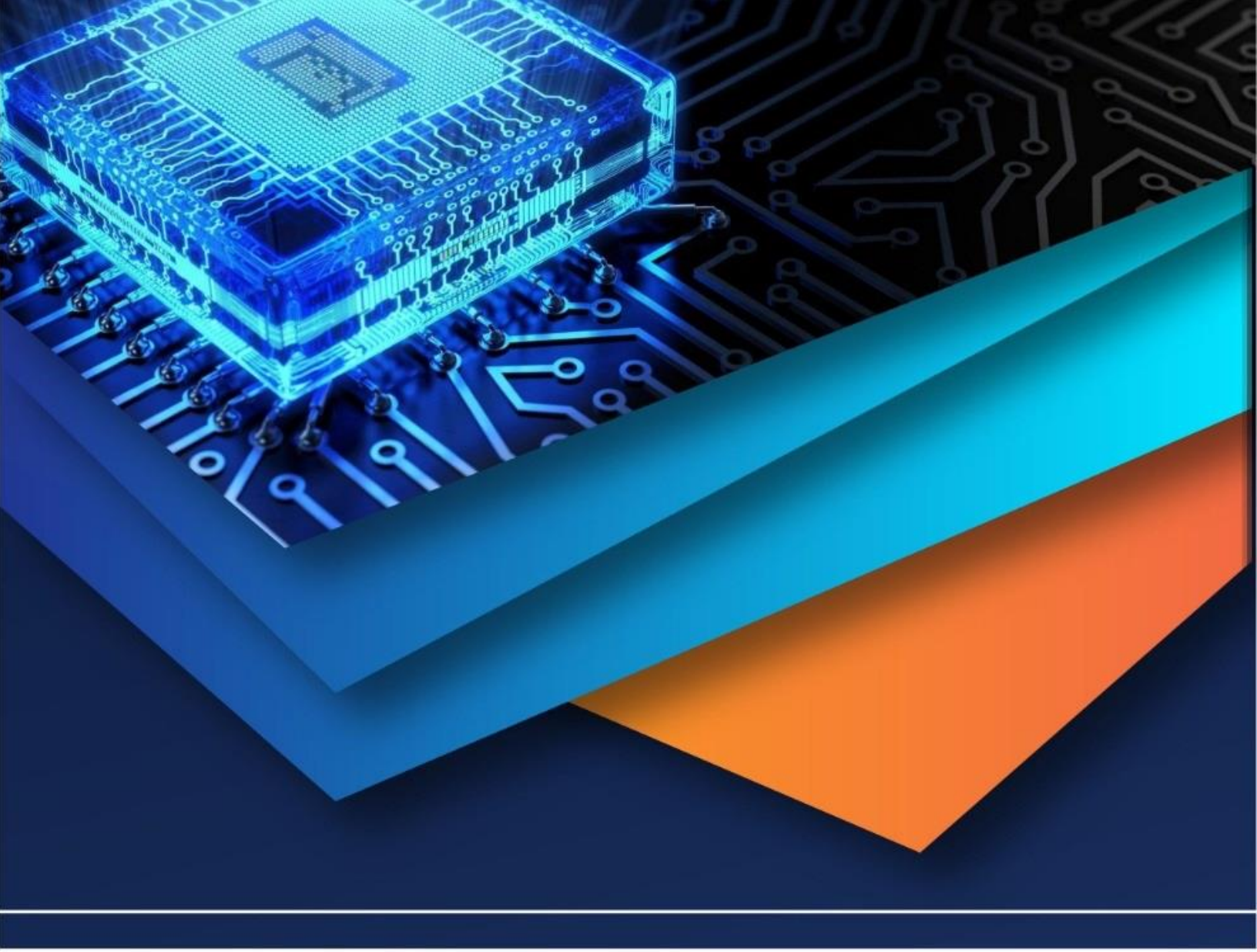

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