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# A Study On Environmental Impact Assessment (Eia) For A Sugar Industry

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## ABSTRACT

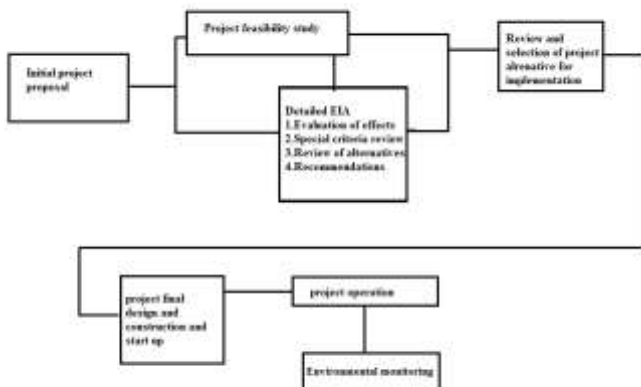
Environmental impact assessment study is important in nowadays because it leads to sustainable development and helps the decision makers whether to precede the project or not. In this project environmental impact assessment study is carried for the proposed sugar industry of 5000 tons of canes per day. The total cost of this project is 300 crores. The proposed sugar industry is located in Kozhundirampattu village in the Villupuram district of Tamil Nadu. An area of 10 km radius around the proposed project site is taken as study area and assessment is made. As per ministry of environment and forest notification released on 14th September, 2006 this project comes under category B and hence it needs environmental clearance from State Environmental Impact Assessment Authority of Tamil Nadu. All the preventive measures are taken in order to protect the environment.

**Index Terms**—Byproduct of sugarcane, Land pattern, soil characteristics, water environment, Air environment, Noise environment, ambient level, ecological studies and management plans.

## 1. INTRODUCTION

An environmental impact assessment (EIA) is an assessment of the possible positive or negative impact that a proposed project have on the environment, together consisting of the environmental, social and economic aspects. The purpose of the assessment is to ensure that decision makers to consider the ensuing environmental impacts when deciding whether to proceed with a project. In India environmental impact assessment is governed by ministry of environment and forest department (MoEF). They developed certain laws and regulations for developing new projects, modernization and expansion of existing project. In order to start a new project, modernization or expansion one has to get approved from MoEF or state environmental impact assessment authority based on the category of the project. In this case the proposed sugar industry of 5000 Tons of Cane

per Day (TCD) comes under category B needs environmental clearance from SEIAA. Hence EIA report is prepared comprising of impacts and also a management plan should be prepared to manage the negative impacts.



**Fig no 1.1 Relationship of EIA process to project planning and implementation**

### 1.1 OBJECTIVES

1. To study manufacturing process and resource requirement for the sugar industry.
2. To select a project site and assess baseline quality of environment
3. To anticipate and avoid, minimize or offset the adverse significant biophysical, social and other relevant effects of development proposals
4. To develop environmental monitoring programme to maintain the quality of environment

## 2. STAGES IN THE ENVIRONMENTAL CLEARANCE PROCESS

### 2.1 Screening:

The projects requiring an Environmental Impact Assessment report shall be termed Category 'B1' and remaining projects shall be termed Category 'B2' and will not require an Environment Impact Assessment report. For categorization of projects into B1 or B2 except item 8 (b), the Ministry of Environment and Forests shall issue appropriate guidelines from time to time.

Water requirement in kilo litres per day	<b>Process</b>	650
	Cooling tower	1000
	Domestic purposes	35
	Floor washings	75
Total		1760 KLD

### 2.2 Scoping:

An Environment Impact Assessment (EIA) Report in respect of the project or activity for which prior

environmental clearance is sought.

### 2.3 Public Consultation:

“Public Consultation” refers to the process by which the concerns of local affected persons and others who have plausible stake in the environmental impacts of the project.

### 2.4 Appraisal:

Documents like the Final EIA report, outcome of the public consultations including public hearing proceedings, submitted by the applicant to the regulatory authority concerned for grant of environmental clearance.

## 3. PROCESS DESCRIPTION OF SUGAR INDUSTRY

### 3.1 Raw Material Requirement:

The proposed sugar industry has a capacity of 5000 TCD and will produce white crystal sugar of 1, 50,000 MT/Annum Details of raw material consumption for 5000 TCD plant are given in table no 2.1

**Table 3.1 Raw Material Requirement of Sugar**

Material	Units	Quantity
Sugar cane	T/Day	5000
Sulphur	T/Month	70 to 80
Lime	T/Month	280 to 300
Caustic Soda flakes	T/Month	6.0 to 7.0
Sodium Hydro Sulphate	T/Month	0.48 to 0.54
Bleaching powder	T/Month	0.2 to 0.3
Lubricants	kL/Month	10 to 12

### 3.2 Water Requirement:

The water requirement is satisfied by bore wells and nearby lakes. The total water requirement of sugar industry is 1760 kilo litres per day.

**Table No 3.2 Water Requirement**

### 3.3 By Products Generation:

The following table shows the various byproducts generated from the sugar industry and their quantity.

**Table no 3.3 Waste Generation from Sugar Industry**

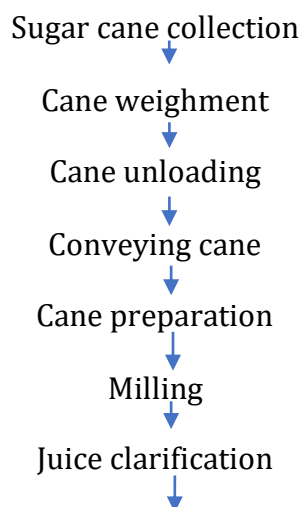
S.no	By products	Quantity per annum
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1	Bagasse	3,15,000 MT
2	Press mud	40,500 MT
3	Molasses	60,000 MT

#### 4. METHODOLOGY

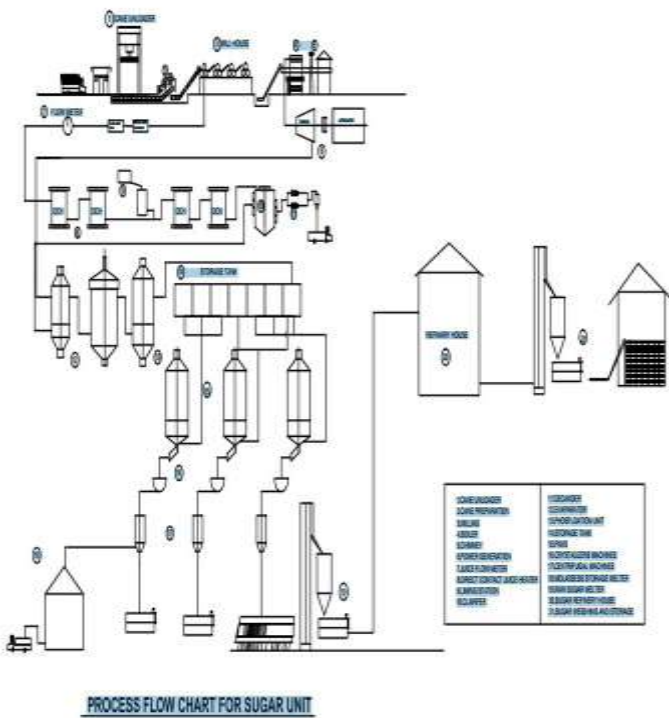
The work has been initiated with the raw materials identification and collected by segregate the waste solid materials. Separation of raw materials (non - combustible waste) are done by magnetic separation and manual separation. Initially the hand separation is done under basic knowledge of classification. The Magnetic separator machine HS-8474 was used in this work. This type of magnetic separator is used for recovering steel and iron. This work was done by the magnetic drum separator and overhead belt magnet separators. This machine separates ferrous material from non-ferrous materials. The mixture of iron filling sand, ceramic magnets, iodine to attract ferrous particles and extract them has output. The segregated waste ingredients were dried in natural sunlight, which are uniformly distributed on an open paved place of about 2.8m for 24 to 48 hours. The vehicle

bringing sugar canes are received at the factory cane yard. The vehicles carrying the sugar cane are weighed on the platform type electronic weighbridges and released for unloading. The gross weight is recorded and printed. The cart cane is manually unloaded directly to the cane carrier. The cane from the feeder table is then dumped to the main cane carrier, which conveys the cane to the cane preparatory devices. The preparatory index is about 85 - 90 %.The cane is conveyed between mills with the help of rake type mechanical conveyors. The juice is first heated to a temperature of 700 c in a tubular type vertical heater by using heat of vapors from the third effect of quintuple effect evaporator. A three stage boiling scheme is adopted to produce quality sugar with minimum sugar loss. The storage capacity of these storage bins is enough to store 24 hours production. The sugar is discharged from bins to fill 50 kg/ 100 kg bags and weighed automatically by electronic type automatic weighting machines. The sugar bags are transported to warehouse through belt conveyors



Evaporation  
 ↓  
 Pan boiling  
 ↓  
 Cooling and curing

**Fig 4.1 Methodology flow chart**

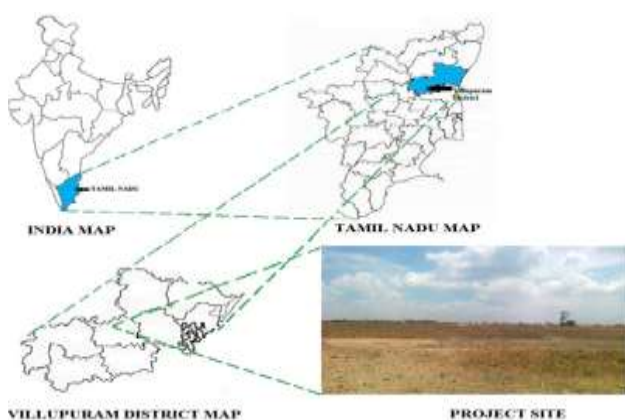


**Fig 4.2 Layout for Manufacturing Process of Sugar**

**4.1 DESCRIPTION OF PROJECT SITE**

**A. LOCATION OF PROJECT SITE**

The proposed project site is located in latitude 11° 59' 44" N and longitude 78° 08' 51" E at KozhundiramPattu village in the Villupuram district of Tamil Nadu. From the notification 2006 it clearly shows this project comes under category B and require environmental clearance from SEIAA. The total area selected for this project is 50 acres. The Kozhundirampattu village is located in Villupuram district of Tamil Nadu. This village comes under Thirukovilur Taluk. The total number of peoples in this village is 1486 out of these 746 are men and 740 are women. In this village 35 acres of land is used by the people for residence.



**Fig No. 4.3 Location of Project Site in India Map**

**Table 4.1 Location features of proposed site**

S.No	Features	Particulars
1.	Location	The project site is located in kozhundirampattu village in villupuram district of Tamilnadu
2.	Present Land use	Nil
3.	Temp., Max and Min	Temperature varies from 20°C to 45°C
4.	Average Humidity	60%
5.	Annual Rainfall	484 mm
6.	Soil Type	Sand with fine grained soil
7.	Topography	Plain
8.	Nearest Village	Kozhundirampattu village is located at 1km from project site
9.	Nearest Town	Thirukovilur is located from 6.95 km from project site

S.NO	TYPE OF TEST	Nearest Industry	Madras sugar plant located from 13 km from project site	Sample 1 (ground water)	Sample 2 (lake)
11.	Latitude			7.2 11°59'44" N	8.2
12.	Longitude			71°08'51" E	
2	Electrical Conductivity			0.7	0.1
3	Carbonate (meq/ L)			0.5	-
4	Bi-Carbonate (meq/ L)			1.3	0.2
5	Chloride (meq/ L)			3.2	0.8
	<b>Parameter</b>	<b>Desirable limit</b>		<b>Sample 1</b>	<b>Sample 2</b>
6	colour	Sulphate (meq/L)		colorless	Colorless
7	pH	Calcium (meq/L)	6.5 to 8.5	7.2	8.2
	Calcium (mg/L)		75	16	4
8	Magnesium (mg/L)	Magnesium	30	2.2	-
	Sulphates (mg/L)	(meq/ L)	150	57.66	-
9	odour	Sodium	unobjectionable	No odour	No odour
		(meq/ L)			
10		Potassium		2.1	-
		(meq/ L)			

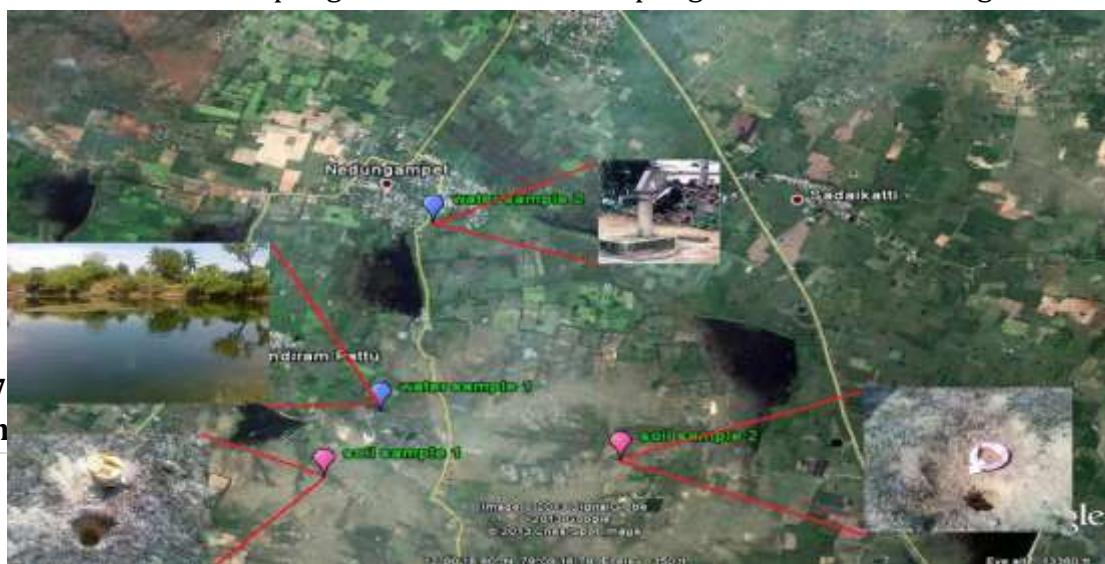
**Table no 4.2 Tested water sample and their results**

✓ **LAND USE PATTERN**

The total land area in this village is approximately 300 hectares out of this 78 hectares are agricultural land and residents used 15 hectares of land and other lands are ponds and waste lands. Major crops grown in this area are wheat, ground nut and sugar cane.

✓ **WATER ENVIRONMENT**

The water samples verified against the Indian standards mentioned in the IS 10500 (drinking water standards). Two samples were collected one from ground water source and other from lake. The location of water sampling stations and soil sampling stations shown in fig 4.3



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## **Fig 4.4 Sample Collection Stations**

### **5. AIR POLLUTION CONTROL MEASURES**

#### **5.1 Impacts On Noise Environment**

During construction, no significant impact is envisaged as most of the construction equipment produce noise level below 75 dB (A).The major noise generating source is steam turbine used for power generation. The noise level from the STG is about 90dB (A).The following are the likely spot noise levels from the plant complex.

#### **5.2 Noise Pollution Control Measures**

- The use of complete or partial enclosures.
- Attenuation by use of sound absorbents on walls and fixed or suspended ceilings
- Introduction of control and monitoring rooms having good sound insulation properties.
- The reduction or elimination of noise leakage paths
- The use of vibration insulation techniques

#### **5.3 IMPACTS ON WATER ENVIRONMENT**

Water drawn from intake will be distributed to various units without any primary treatment. The recovered condensate water will be used in the areas where good quality water is required. Water supplied to boiler as makeup for steam generation is subjected to treatment in DM plant. Drinking water supplied for drinking purpose is disinfected before used.

#### **5.4. Applicable Environmental Regulations and Standards**

Water (Prevention and Control of Pollution) Act, 1974 as amended in 1978 and 1988:

Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987:

Environment (Protection) Act, 1986 amended in 1991 and Environment (Protection) rules, 1986 and amendments thereafter

Hazardous Waste (Management & Handling) Rules, 1989, as amended in 2000 and 20.05.2 003.

The Noise Pollution (Regulation and Control) Rules, 2000 and as amended in 22.11.2000.

#### **5.5. Future Scope of The Work**

Every anthropogenic activity has some impact on the environment. More often it is harmful to the environment than benign. However, mankind as it is developed today cannot live without taking up these activities for his food, security and other needs. Consequently, there is a need to harmonize



developmental activities with the environmental concerns. Environmental impact assessment (EIA) is one of the tools available with the planners to achieve the above -mentioned goal. It is desirable to ensure that the development options under consideration are sustainable. In doing so, environmental consequences must be characterized early in the project cycle and accounted for in the project design. The objective of EIA is to foresee the potential environmental problems that would arise out of a proposed development and address them in the project's planning and design stage. EIA process flow chart is shown in fig no 1.1. The EIA process should then allow for the communication of this information to

- (a) The project proponent
- (b) The regulatory agencies
- (c) All stakeholders and interest groups

## **6. Conclusion**

The environmental impact assessment for the proposed sugar industry clearly shows that the baseline environmental quality of the environment is good and it is suitable for the construction of sugar industry on the proposed site. The impacts of the proposed sugar industry are managed by an Environmental management plan. The sugar industry is beneficial to Kozhundirampattu village and it leads to overall development of the region. Hence this project should be approved.

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