

**EXECUTIVE SUMMARY INDEX  
FOR  
Integrated Sugar (5000tcd), Ethanol (60klpd)  
And Cogeneration Power Plant (30 Mw)  
At  
KAPSHI, PHALTAN, SATARA (MAHARASHTRA)**



**By,  
Sharayu Agro Industries Ltd.  
(Formerly known as – Lokmanya Sakhar Udyog Ltd.)**

**May 2015**

---

---

## **EXECUTIVE SUMMARY**

---

---



# Executive Summary

## Index

<b>Sr No</b>	<b>HEADING</b>	<b>PAGE NO</b>
1.1	INTRODUCTION	1
1.2	NEED OF PUBLIC HEARING	1
1.3	HIGHLIGHTS OF THE PROJECT	2
1.4	RAW MATERIAL	2
1.5	WATER REQUIREMENT	4
1.6	SUGAR, ALCOHOL AND COGENERATION PROCESS	4
1.7	BASE LINE ENVIRONMENTAL STATUS	5
1.8	ENVIRONMENTAL IMPACT PREDICTION	7
1.9	IMPACT DURING CONSTRUCTION PHASE	8
1.10	IMPACT DURING OPERATION PHASE	9
1.11	ENVIRONMENT MANAGEMENT PLAN	11
1.12	MONITORING PLAN	13
1.13	EMP BUDGET	14
1.14	RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN	14
1.15	CONCLUSION	19



## **1.1 INTRODUCTION**

Sharayu Agro Industries Ltd. (Formerly Known as Lokmanya Sakhar Udyog Ltd) is registered in the State of Maharashtra under the Companies Act, 1956 on 21st February, 2011 vide registration No U15430PN2011PLC38601.

Now, SAIL proposes to set up integrated 5000 TCD sugar plant along with eco-friendly 30MW capacity cogen power project for decentralized generation of export able surplus power, mainly from renewable sources of fuel and 60 KLPD ethanol plant, to be located at Kapshi, Tehsil Phaltan, Dist. Satara of Maharashtra.

The integrated project comprises of a sugar mill for the manufacture of high quality sugar, thereby making available required bagasse for the cogen power plant and molasses for ethanol plant. The command area of the proposed sugar mill has excellent irrigation facilities, potential for sustained cane supply to the sugar mill, molasses and biomass availability. The aggregated capital investment for the integrated project has been estimated at Rs. 323.70 crore.

## **1.2 NEED OF PUBLIC HEARING**

Moreover, sugar, co-generation power and distillery project proposed to be set up in the State of Karnataka Government require environmental clearance from Ministry of Environment and Forest, New Delhi based on Sept 2006 notification on environment impact assessment by Union Ministry of Environment and Forest vide No. SO 1533 subject to project is located within radius of ten km boundary of reserved forest reserved forest, ecologically sensitive area which may include National Parks, Sanctuaries, Biosphere Reserves, critically polluted area and interstate boundary shall require environmental clearance from Central Government. Hence, SAIL submitted an application for environmental clearance to Ministry of Environment and Forest, New Delhi for terms of reference approval for Sugar, Distillery and Cogen power project. The ToR was approved by Union Ministry of Environment, Forest and Climate Change New Delhi vide letter no. J-11011/403 /2014 -IAII (I) dated March 31, 2015.

### 1.3 HIGHLIGHTS OF THE PROJECT

#### Salient Features of project

1	Name of Company and project Location	<b>M/s Sharayu Agro Industries Ltd.</b> Factory Site: At Kapshi, Taluka : Phaltan, District : Satara, Maharashtra.
2	Constitution & Type	Public limited company
3	Products	Sugar, Ethanol & Power
4	Geocodes	17° 56' 32.50" N 74° 15' 16.50" E
5	Distance from nearest town / city	Phaltan, 25 Km
6	Distance from nearest airport	Pune, 112 Km
7	Distance from nearest Railway Station	Wathar, 18 Km
8	Distance from nearest water source	Nira Cannel, 12 Km
9	Distance from nearest MSEDCL EHV substation	14 Km, Phaltan at 132 kV Substation
10	Installed Capacities of the Integrated Project Sugar Plant Ethanol Plant Cogen Power Plant	5000 TCD (22 hrs basis) 60 KPLD (300 Operating days) 30.00 MW installed capacity 19.77 MW (Avg. exportable power, Season 160 days) 26.60 MW (Avg. exportable power, Off Season 65 days)

### 1.4 RAW MATERIAL

#### Sugar Plant

The proposed sugar plant of 5000 TCD will require about 8.00 lakh MT of sugarcane for 160 days crushing season, including sugarcane required for seeding purposes. About 11.43 lakh MT sugarcane is already available within the command area of the proposed factory site.

The irrigation & climatic conditions are quite conducive. Considering this situation & long term cane development program being adopted by SAIL, the proposed project will not have any difficulty for making the required sugar cane available for crushing for the proposed capacity & even further expansion

#### Cogen Power Plant

As indicated in the steam / power cycle design, the total bagasse available from the sugar mill, from cane crushing of 8.00 lakh MT, as fuel, will be 2,33,600 MT after bagacillo & handling losses. Out of this, 2,21,414 MT (57.66 TPH x 24 x 160) will be utilized by the cogen plant boiler during season, leaving saved bagasse of about 12186 MT for the off season operation. Total bagasse requirement for the off-season is 78,629 MT (50.40TPH). Out of which 12186 MT saved bagasse will be utilized, leaving net bagasse requirement of 66,443 MT. The use of biomass materials like cane trash available in the command area can meet this requirement. The net equivalent cane trash required for off-season operation has been worked at 21437 MT. The imported coal equivalent bagasse will be used in exigencies upto 15% of total annual requirement which works out at 45007 MT. The actual quantities of cane trash & imported coal required will be 14616 MT & 18412 MT, respectively.

Procurement of raw materials for off-season operation of the cogen power plant must become a line function of cogen plant operation with appointment of Fuel Manager and competent field staff for the purpose.

The detailed biomass assessment survey was carried out. It is seen that huge quantity of cane trash

to the tune of 2.14 lakh MT can be easily procured & made available for off-season operation of the proposed cogen power plant. Considering the requirement & availability, SAIL will not have any difficulty in procuring cane trash.

Energy plantation on wasteland in the command area will also be evaluated and implemented for long-term fuel linkage for the proposed cogen power plant.

Therefore, no difficulty envisaged in getting fuel for cogen plant for 225 days of operation.

#### Ethanol Plant

Ethanol plant will be operated for 300 days a year. The total molasses required for the operation at 100% capacity utilization will be 76596 MT. At 4.00% on cane the net molasses generated from the sugar factory will be 32,000MT. The outside molasses required therefore will be 44596 MT. Own molasses will be sufficient for 125 days of operation. For balance 175 days molasses will be procured from nearby sugar factories



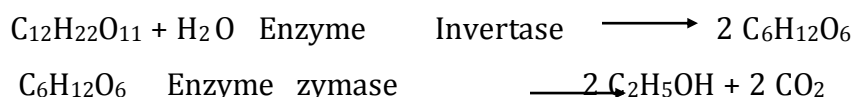
## 1.5 WATER REQUIREMENT

Unit	Quantity m3/day
Sugar	500
Cogeneration unit	620
Distillery	432
Domestic	40
<b>Total</b>	<b>1592</b>

The source of water is Nira Canal which is located at 12 Km from project site.

## 1.6 SUGAR, ALCOHOL AND COGENERATION PROCESS

Cane from nearby area will be crushed to get sugar cane juice which will further be concentrated to get quality sugar crystals. Uncrystallised sugar collected in molasses will be fermented to form alcohol with Yeast cells.



Alcohol distillation will yield quality rectified alcohol. Spent wash will be fired in 28 TPH spent wash incineration boiler. Bagasse from cane crushing and coal will be burnt in 160 T/H boiler for cogeneration of 30 MW power with turbo generator.

Press mud from cane juice filtration will be used in composting and the same will be supplied to cane farmers. Ash from boiler will be sold to brick producers or used in land filling.

### Bagasse / Fuel Balance

The bagasse and fuel balances are indicated in the following table

Sr. No.	Item	Value	
		Season	Off season
1.	Crushing rate, TCH	227.27	
2.	Bagasse generation at 30.0% on cane, TPH	68.18	
3.	Bagacillo/handling loss at 0.8% on cane, TPH	1.82	
4.	Bagasse available as fuel at 29.2% on cane, TPH,MT	66.36 (233600)	
5.	Bagasse consumed by new boilers, TPH (MT)	57.66 (221414)	50.40 (78629)
7.	Bagasse saved / available for off season operation, MT		12186
8	Cane Trash requirement, MT (Equivalent bagasse)		21437
9	Imported coal requirement, (MT) (Equivalent bagasse)		45007

10.	Actual cane trash requirement, MT		14616
11.	Actual Imported coal requirement, (MT)		18412
12.	Saved Bagasse days		10
13.	Days on Imported Coal		37
14.	Days on cane trash		18

### Power Balance

Following table gives the power balance for the season and off-season:

Sr.No	Item	Value, MW	
		Season	Off
1.	Power generation, MW	27.47	30.00
2.	Power consumption, MW		
	- Sugar process (@ 21 kW / TCH	4.77	0.10
	- Colony	0.10	0.10
	- Ethanol Plant	0.35	0.35
	- Cogeneration auxiliaries	2.47	2.85
	- Total	7.69	3.40
3.	Power export, MW	19.77	26.60
4.	Power export at design capacity level, MU	75.93	41.50
5.	Total, season + off season MU at design	117.4	

## 1.7 BASELINE ENVIRONMENTAL STATUS

### 1.7.1 PHYSICAL ENVIRONMENT

#### Site Location

The proposed project site of Sharayu Agro Industries Ltd, is at Village Kapashi, Tal: Phalatan, Dist : Satara. of Maharashtra State. The proposed site is plane and there are no undulations. It has gentle slope towards south side. The Gocodes of the site are 17° 56' 32.50" N 74 ° 15' 16.50"E. The elevation of the site is 649 AMSL.

#### Site location and Surrounding

On the boundary of Taluka Phaltan on the north Dist Pune, on east side Dist Solapur, on west taluka Khandala, and south Taluka Man and Khatav exist. No wild life sanctuary or ecological sensitive area exists within 10 Km radius from site.

#### Road Connectivity to Site

On south of project site Phaltan Satara district road exist at 1 Km . On northern side at 9.5 Km Lonand Phaltan road exist on western side Shirur Satara road exist at 9.6 Km.

### GENERAL FEATURES OF THE SATARA & SURROUNDINGS

Satara district lies at the Western limit of the Deccan table and southern Maharashtra. It is situated in the river basins of the Bhima and Krishna rivers but from the point of view of the

Peninsular drainage, the entire land of the district belong to larger drainage system of Krishna river. The district extends between 17° 5' and 18° 11' north latitudes and 73° 33' and 74°54' east longitude. Residual hill ranges and the intermediate valleys, all well developed on a table land surface, from the main element of landscape in the district. All along the western boundary of the district is the Sahyadrian ranges. The Crestline proper is a succession of high plateau interrupted by occasional rounded peaks and connected by low saddles. The Mahadeo range, which is the next major well developed range, begins as an off shoot of the Sahyadris in the north –western part of the district. It runs eastward as a main range and send off several minor ranges south-eastward and southward. These major ranges enclose between them the major river system of Satara.

The physical setting of Satara shows a contrast of immense dimensions and reveals a variety of landscape influenced by relief, climate and vegetation. The variation in relief ranges from the pinnacles and high plateaus of the main Sahyadrians range having height over 4500 feet above mean sea level to the subdued basin of the Hira river in Phaltan tahsil with an average height of about 1700 feet above mean sea level.

### 1.7.3 Salient Features of baseline Environmental Studies

Parameters	Study	Inference
Micrometeorological Study	Wind Profile, Temperature, Humidity, rainfall	To assess air pollution impacts on neighboring environment
Air Quality Data	Particulate Matter PM <sub>10</sub> and PM <sub>2.5</sub> micron Sulphur Dioxide (SO <sub>2</sub> ) Oxides of nitrogen (NO <sub>x</sub> ) Carbon Monoxide (CO)	To assess air quality
Noise Quality	Noise	To identify Noise levels
Water and Soil Study	Physicochemical analysis	To assess quality of water and soil
Socio-Economic Study	Demography and occupation and Amenities in the area	To asses human index

### Monitoring location for Air, Noise, Soil, and Water with Direction

Sr. No.	Name of Village	Distance from Project Site	Direction	Latitude	Longitude
A1	Project Site	0	-	17° 56' 32.11"	74° 15' 16.22"
A2	Kapashi	1.68	SW	17° 56' 2.79"	74° 14' 27.4"
A3	Alijapur	3.20	S	17° 55' 3.1"	74° 14' 46.97"
A4	Adarki Bk	4.3	WSS	17° 55' 14.4"	74° 13' 9.77"
A5	Bibi	2.78	SE	17° 55' 35.4"	74° 16' 38.8"

A6	Ghadgewadi	2.68	E	17° 57' 7.8"	74° 16' 56.3"
A7	Takubaichiwadi	2.11	N	17° 57' 53.37"	74° 14' 54.4"
A8	Nandal	7.7	NE	17° 59' 13.99"	74° 18' 44.96"

### Air Environment

Sr. No	Location	24 Hour 98 percentile Concentration in $\mu\text{g}/\text{m}^3$				CO mg/M3
		PM10	PM 2.5	SO2	NOx	
A1	Project Site	58.1	15.7	11.4	18.7	2.0
A2	Kapashi	62.1	20.95	12.25	20.53	1.31
A3	Alijapur	57.9	15.2	7.2	12.89	0.93
A4	Adarki Bk	40.2	21.7	7.8	12.9	0.88
A5	Bibi	51.4	16.3	7.98	14.9	0.986
A6	Ghadgewadi	52.3	19.6	8.5	16.5	1.13
A7	Takubaichiwadi	48.9	28.6	9.45	15.7	0.86
A8	Nandal	51.7	21.8	7.6	12.4	0.8
	CPCB Standard	100	60	80	80	4

The ambient air quality observed during the study period is well within the prescribed National Ambient Air Quality Standards.

### 1.7.5 Noise Environment

The noise levels observed on all locations were in range of 47.9 – 53.8dBA during day time and 37.1 – 41.8(at project site) dBA during night time.

### 1.7.6 Water Quality

The ground water quality at 4 locations was monitored. It was observed the hardness of water was in the range of 152 to 332 mg/l which is not on higher side. The surface water from water from Nira Canal at Adarki Kh was also analyzed and it was found that it is potable.

### 1.7.7 Biological Environment

The study of Flora and Fauna in the 10 km radius from the project site was carried out. The eco sensitive and wild life sanctuary was not found in 10 Km radius. In the study area trees like Neem, Tamrind, Karanj, Umber, Pipal, Babul and some common trees were observed. As regards fauna is concerned Mongoose, jackal, Squirrel were among the mammals, frog from amphibian, Naja-Naja, Viper from reptiles were noticed. Among the avifauna, Drango, Parrot, Crow, and Green bea eater were are found.

## 1.8 ENVIRONMENTAL IMPACT PREDICTION

Environmental impact in the study area reflects in any changes of environmental conditions, adverse or beneficial effects caused or induced by the impact of project if implemented. Superimposition of predicted impact over pre-project base line data shows final picture of

environmental conditions. Step of quantitative impact prediction leads to decline suitable environment management plan needed to implement before initiation of project, commissioning stage to mitigate adverse effects on environmental quality. Impact prediction in various areas of air, water, soil, noise, socio-economic for alcohol distillery are given in following sections.

Plant involves activities to set up a plant, machinery, create infrastructure to transport raw material, finished products. It causes various impacts on air & water quality, noise levels, socio-economic environment etc. Next steps describe a brief description of the environmental impacts of proposed distillery project both in construction and operational phases and methodology and results of mathematical and simulation models used in their prediction.

### **1.9 IMPACT DURING CONSTRUCTION PHASE**

Project construction phase will be of one and half year whose activities will surely show effects on land environment, water, air, noise level, soil quality, socio-economic trend etc.

#### **1.9.1 Land Environment**

Some excavation, land filling and development aspects may be needed for leveling of the ground.

#### **1.9.2 Water Environment**

During construction hardly 50m<sup>3</sup> water will be required for slab working. The construction activity will not have any effect on ground as well as surface water. Even the domestic waste water generated in the labour camp is also very low.

#### **Mitigation**

Waste water generated during construction is insignificant. Proper sanitation facility will be provided with septic tank so that there will be no negative impact on water.

#### **1.9.3 Air Environment**

During construction activity there is a probability of increase in SPM due to transportation of trucks, trolleys construction debris, cement etc.

**Mitigation:** all the vehicles permitted at the project site will be possessing Pollution under control certificate. There will be provision of water sprinkling on the project site to control dust emission.

#### **1.9.4 Noise Environment**

The construction activity will generate noise due to vehicles like trucks and machinery like bulldozers, concrete mixers, cranes etc. the noise levels are between 70 to 80 dB.

**Mitigation:**

All the workers involved in the construction works are provided with ear plugs to avoid continuous exposure of noise. Noise exposure can also be minimized by shock absorbing techniques such as noise barriers, silencers etc. in the equipment.

**1.9.5 Occupational Safety**

During the construction there are chances of minor or major accidents at the site.

**Mitigation:**

All the workers will be provided with helmets, goggles and safety instructions in the form of manuals and also first-aid will be made available.

**1.10 IMPACT DURING OPERATION PHASE**

The operations and their respective impacts in ethanol manufacturing units are as follows:

**1.10.1 Impact on Land or soil**

The solid waste generated from the ethanol plant is mainly in the form of press mud. This solid waste in case dump on land will create soil degradation or underground water pollution.

**1.10.2 Impact due to solid residue**

Press mud is obtained in sugar production. Ash formation will occur due to use of Bagasse as fuels in boiler. Ash (small quantity) will be collected, mixed in press mud & distributed free to farmers during season & during off season will be given to nearby brick manufacturers it can also be used as a material for land filling.

**Mitigation:**

Press mud can be used as bio-compost along with spent wash. Fly ash generated during combustion in boiler will be used as a material in fertilizer as well as in brick manufacturing.

**1.10.3 Impact on water environment**

Water needed for plant will be available from Nira canal. SAIL intends to intake 1592m<sup>3</sup>/day of water per day to fulfill the needs of sugar mill, distillery, co-generation plant and residential colony. Of the total water requirement of 1592m<sup>3</sup>/day, 500 m<sup>3</sup>/day be use for sugar plant, 620 m<sup>3</sup>/day shall be use for Co generation plant, 432 m<sup>3</sup>/day shall be use for Distillery and 40 m<sup>3</sup>/day will be use for domestic purposes.

**Mitigation :** The recycled water will be treat and reuse inside the plant, recycle and reuse scheme will be adopted so as to prevent water pollution. Zero liquid discharge scheme is

implemented for Distillery. In this scheme spent wash after bio digester will be taken to seven multiple evaporator and concentrated spent wash is burned in incinerator boiler.

#### **1.10.4 Impact on Air Environment**

The common process involved in the units is the use of boiler and turbine. The air environment gets polluted due to emission of suspended particulate matter having particle size less than 50 microns. It also affects the crops grown in the nearby areas. So it has negative impact on the health of people.

Due to existing state highways & less distances for carts, trucks to reach site the suspended particulate matter generation will be in specified limits.

Fly ash will be collected from electrostatic precipitator, air heater hoppers, ash from boiler bottom hoppers, total quantity being less than 2 % can be subjected to suitable fertilizer and brick.

The overall Scenario with predicted concentrations over the baseline is shown below

After commissioning of plant average GLC of SPM is measured considering both the boiler stacks in the terms of 24 hour concentration, will increase by Maximum  $0.025\mu\text{g}/\text{m}^3$  as shown in Isopleths, the  $\text{SO}_2$  and  $\text{NO}_x$  is also predicted from 28 TPH spent wash fired boiler is measured in the range of  $2.55\mu\text{g}/\text{m}^3$  and  $1.15\mu\text{g}/\text{m}^3$ .

#### **Mitigation:**

To avoid negative impact on the air quality of nearby area mitigation measures such as effective stack height (86 m and 60m) and use of air pollution control devices such as Electrostatic precipitator is proposed

#### **1.10.5 Impact due to transportation**

Vehicle traffic due to transportation of molasses, finished materials alcohol etc. will be increased. Transport of the items will be done with trucks. Traffic with jeeps, buses, cars, ambulance etc. will also be there. Traffic on road will create rise in particulate matter. Metalled roads already exist in the site area which will keep minimum SPM level. Thus fugitive emissions will be at minimum levels.

#### **Mitigation**

SAIL puts a strategy to check regularly the PUC of all auto vehicles, servicing & maintenance, in order to have minimum environmental impact due to the vehicle exhaust emission. Garden & tree plantation plans will ensure the target of minimum fugitive emissions. SAIL proposes better level of housekeeping in all departments of sugar mill, power generation, and colony area to get clean area.

### **1.10.6 Impact on Noise environment**

Noise, an unwanted sound, affects human being. Excessive exposure to noise produces varying degree of damage to hearing system. It leads to headache, fatigue etc. the main sources of noise are steam turbine, boiler, DG sets, etc. most of them generate noise level up to 70-90 dB A. Road traffic will also result in rise in noise levels. Continuous exposure of increased level of noise will have an adverse impact on the health of workers as well as the people residing in surrounding area. Prolonged exposure can lead to temporary or even permanent deafness.

Noise making Equipments such as cutters, crushers, mixers, pumps, boilers etc. All connecting roads to plant will be metalled one. Vehicle maintenance, proper lubrication to machinery will be arranged. Tree plantation on the campus and on the connecting roads is initiated and will be done each year.

#### **Mitigation**

All the workers will be provided with ear plugs, proper maintenance of pumps. All the transporters will be advice to carry out regular maintenance of their vehicles.

### **1.10.7 Impact on Socio-economic environment**

SAIL is located in an isolated area. MSPSL management thought that it would be advantageous to improve the living conditions of people in and around the plant site. It also proposes to employ local skilled and unskilled workers. It will therefore generate employment in the local area. In turn local people can avoid uncertainty of job, raise their living standard, do supplementary jobs of cane & other farming, cattle, poultry, brick making unit etc. thus to stabilize & prosper in life. This will surely be a positive impact.

### **1.10.8 Socio economic pattern**

SAIL has already initiated process to select & employ key persons for project. In nearby period full employment, colony creation will give them space to reside thus to get settled in the area.

## **1.11 Environment Management Plan**

### **1.11.1 Air Pollution control**

The following measures shall be adopted for the control of emissions in the sugar, cogen and Distillery unit

- Suitably designed electro static precipitator with efficiency of 98.36 % for bagasse based boiler and 99.2% for spentwash fired boiler shall be placed downstream of the stack which will separate out the incoming dust in flue gas and limit the dust concentration at its designed outlet concentration of 150 mg/Nm<sup>3</sup>



- For the effective dispersion of the pollutants stack height has been fixed based on the CPCB requirements. The height of the stack shall be 86 m for bagasse based boiler and 60m for spentwash fired boiler.
- ESP is attached to collect and control fly ash emission.
- For DG sets, stacks of adequate height shall be provided.
- All vehicles and their exhausts shall be well maintained and regularly tested for emission concentration.
- Adequate thickness of insulating material with proper fastening shall be provided to control the thermal pollution.
- Regular preventive maintenance of pollution control equipment shall be carried out.
- Stack emission shall be regularly monitored external agencies on periodic basis.

#### **1.11.2 Noise Pollution Control**

All rotating equipments shall be lubricated and provided with enclosures as far as possible to reduce noise emissions.

Provision of silencer will be made wherever possible.

#### **1.11.3 Water Pollution control**

The waste water generated from Sugar and Cogen power plant will be treated in the Effluent treatment plant. The treated water will be diluted with non process waste water after neutralization in polishing pond. The outlet of the polishing pond conforming to the GSR 422 E on land discharge standard is used for green belt development and sugar cane cultivation. Of the area of 78 acre available 26.11acre is available for green belt.

The treatment of spent wash from Distillery include use of triple effect evaporator to concentrate spent wash which is further burned in boiler. Hence, as per CPCB norms zero effluent discharge is achieved.

The domestic sewage will be disposed by using compact STP.

#### **1.11.4 SOLID WASTE MANAGEMENT**

##### **PRESS MUD STORAGE YARD**

The press mud storage yard of 75 m x 50 m will be made impervious by constructing it with 300 mm thick stone soling. 200 mm thick base garland canal to collect any leachate are rainy days water. The same water will be collected in a collection tank of 10 m x 10 m x 5 m and the same will be recycled.

SAIL will adopt the state of the art continuous fermentation process with multi pressure vacuum distillation such that the generation of solid waste Yeast sludge obtained is only 0.5 – 1% of the total fermented wash quantity, too less as compared to conventional batch process. For 60 KLPD rectified spirit plant the maximum quantity of sludge produced is 1200 – 2500 Lt./day (wet basis). The sludge will be dried and used for composting.

#### **1.11.5 GREEN BELT DEVELOPMENT**

Tree plantation is one of the effective remedial measures to control the Air pollution and noise pollution. It also causes aesthetics and climatologically improvement of area as well as sustains and supports the biosphere. It is an established fact that trees and vegetation acts as a vast natural sink for the gaseous as well as particulate air pollutants due to enormous surface area of leaves. It also helps to attenuate the ambient noise level. Plantation around the pollution sources control the air pollution by filtering the air particulate and interacting with gaseous pollutant before it reaches to the ground. Tree plantation also acts as buffer and absorber against accidental release of pollutants. The plantation work for green belt development will be carried out as per CPCB guidelines, local species would be preferred.

For effective control of air pollutants in and around the proposed industry, a suitable green belt is proposed by taking into consideration the following criteria. The green belt would;

- Mitigate gaseous emissions
- Have sufficient capability to arrest accidental release.
- Effective in wastewater reuse.
- Maintain the ecological balance.
- Control noise pollution to a considerable extent.
- Prevent soil erosion.
- Improve the Aesthetics.

#### **1.12 MONITORING PLAN**

##### **1.12.1 MONITORING FACILITY**

It is proposed to get the monitoring work done from the laboratory of MPCB initially. In due course of time SAIL may acquire-monitoring equipments namely High Volume Samplers, Stack Monitoring Kit, Automatic recording Weather Monitoring Station, Noise Monitoring Equipments etc. to carry out environmental monitoring work. The in house monitoring shall be highly recommended to save the cost incurred.

### 1.13 EMP BUDGET

#### Capital and operating expenditures for environment protection measures i.e EMP

Sr.No	Particulars	Capital Cost Lakhs	Recurring Cost per Annum in lakhs
1	Air pollution control ESP	400.00	20.0
2	Water pollution control ETP	500.00	2.5
3	Composting	100.00	1.0
4	Noise pollution control	1.0	0.1
5	Occupational Health	-	1.0
6	Environment Monitoring and management	-	1.0
7	Green Belt Development	2.00	0.2
8	Others-Consultation and Training	-	0.5
	<b>Total</b>	<b>1001.0</b>	<b>26.3</b>

### 1.14 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

#### 1.14.1 RISK ASSESSMENT:

Industrial accidents results in great personal and financial loss. Managing these accidental risks in today's environment is the concern of every industry including distillery units, because either real or perceived incidents can quickly jeopardize the financial viability of a business. Many facilities involve various manufacturing processes that have the potential for accidents which may be catastrophic to the plant, work force, environment, or public.

The main objective of the risk assessment study is to propose a comprehensive but simple approach to carry out risk analysis and conducting feasibility studies for industries and planning and management of industrial prototype hazard analysis study in Indian context.

Risk analysis and risk assessment will provide details on Quantitative Risk Assessment (QRA) techniques used world-over to determine risk posed to people who work inside or live near hazardous facilities, and to aid in preparing effective emergency response plans by delineating a Disaster Management Plan (DMP) to handle onsite and offsite emergencies.

QRA may be carried out to serve the following objectives.

1. Identification of safety areas
2. Identification of hazard sources
3. Generation of accidental release scenarios for escape of hazardous materials from the facility
4. Identification of vulnerable units with recourse to hazard indices

5. Estimation of damage distances for the accidental release scenarios with recourse to Maximum Credible Accident (MCA) analysis
6. Hazard and Operability studies (HAZOP) in order to identify potential failure cases of significant consequences

### **Mitigation Measures**

The purpose of mitigation is to identify measures that safeguard the environment and the community affected by the proposal. Mitigation is both a creative and practical phase of the EIA process. It seeks to find the best ways and means of avoiding, minimizing and remedying impacts. Mitigation measures must be translated into action in the correct way and at the right time, if they are to be successful. This process is referred to as impact management and takes place during project implementation. A written plan should be prepared for this purpose, and includes a schedule of agreed actions. Opportunities for impact mitigation will occur throughout the project cycle.

#### **1.14.2 Health and safety measures:**

- Regular inspection and maintenance of pollution control systems.
- Statuary approvals, waste treatment and disposal including stack emissions etc.
- Full fledge fire protection system.
- Gloves and protective equipment to prevent health hazards.
- Use of splash proof safety goggles and shoes.
- To impart training at various levels including contractors and transport personnel's for observing safe work practices.
- Clearly define the procedures for inspection, operation, and emergency shutdown of the process operations.
- To device systematic accident prevention program to ensure safe and healthy working environment.
- The compliance of all statutory regulations.
- Environment monitoring and control of process parameters at various unit operations by providing control measures in the plant.
- Eliminate unreasonable, research and where appropriate, implement advance technology in the design, production services and to prevent pollution as well as conserve, recover and recycle raw materials.

- The workers exposed to noisy sources will be provided with ear muffs/plugs.
- Preventive maintenance activities so as to have smooth operations.
- Audit programs must be carried out to review the management system for identifying, evaluating and controlling environmental, health and safety hazards.
- The health of the workers will be regularly checked by a well qualified doctor and proper records will be kept for each worker.

### 1.14.3 DISASTER OR EMERGENCY CONTROL PLAN

SAIL will be a new growth oriented center in the Indi area district Satara . Such unit can pose threat of danger / hazard due to storage of hazardous materials. Distillery plant also poses electrocution, fire, and explosion hazards. When the full fledged activity of Ethanol Plant will gear up it will have to follow Factories Act 1948 with all amendments till today and any directives from Director Safety, Health & Environment [SHE] will automatically be binding on SAIL. In such condition to appoint a qualified Safety Officer is a must & will be an adequate, wise step in such direction. On site and off site disaster control plans and their perfect implementation will be part and parcel of the management & such safety officer. To lessen the probability of hazard to occur & avoid the consequent damage, a disaster management and control plan has to be worked out for whole complex in anticipation to the threat.

#### 1.14.3.1 TYPE OF DISASTER AT SAIL COMPLEX

- Disaster can occur as on site or off site variety i.e. disaster on campus or disaster in nearby area causing indirect damage to site area & the complex.
- Disaster may occur due to two categories, **natural** and **man made** calamities:
- **Natural calamities cover** Flood, Storm / typhoon, Earthquake, Tsunami, Heavy mist, fog, hail storm, Land slide
- **Man made calamities involve** Fire & Explosion, All types of leakages & spillage, Electrocution, excavation, construction, erection, Sabotage, rail & road accidents, mass agitation, Looting, Morcha, war

The identified hazardous areas in the complex are

1. Boiler area - Explosion
2. Oil tanks - Fire and spillage

3. Turbine section - Explosion
4. Electrical rooms - Fire and electrocution
5. Transformer area - Fire and electrocution
6. Cable - Fire and electrocution
7. Storage facilities – Fire / spillage for fuel and alcohol

#### **1.14.3.2 SITE EMERGENCY CONTROL ROOM (SECR) & SITE MAIN CONTROLLER**

To assist the disaster control more effectively a site emergency control room (SECR) will be established at the plant site. The SECR may be provided with following sections:

- All site plant layout
- List of important telephone numbers of Chairman & Directors SAIL, Chief Engineer, Chief Chemist, Distillery Manager, Administration Manager.
- All material handling & incoming vehicle traffic to be stopped temporarily.
- All out going lines to be used to contact above authorities.
- Captive power plant layout showed with inventories and locations of fuel
- Oil / furnace oil storage tanks, storage yard etc.
- Hazard identification chart, maximum number of people working at a time, assembly points etc

#### **1.14.3.3 DISASTER PREVENTIVE MEASURES**

The proposed power plant will have following preventive measures to avoid occurrence of disasters:

- I. Specification & marking of safe area to gather in emergency.
- II. Design, manufacture and construction of plant, machineries and buildings will be as per national and international codes as applicable in specific cases and laid down by statutory authorities.
- III. Provision of adequate access ways for movement of equipment and personnel shall be kept.

- IV. Minimum two numbers of gates to escape during disaster shall be provided.
- V. Fuel oil storage shall be in protected and fenced. The tank will be housed in a dyke wall. As per regulations of CCOE its testing & certification will be performed each 5 years regularly.
- VI. Proper colour coding for all process water, air & steam lines will be done.
- VII. Proper insulation for all steam & condensate, hot water lines will be done.
- VIII. Provision of circuit breakers, isolation switches, signals will be provided as per electricity act & rules.

Proper & rigid bonding and earthing to all equipment will be arranged

#### 1.14.4 FIRE FIGHTING ARRANGEMENTS

**BIS 2190** provides Indian standards for fire fighting equipment. All fire fighting equipment and extinguishers have to be planned according to this standard.

There are 4 classes of a fire to occur:

Class	Materials	Extinguisher
A	Cotton, Cloth, paper, wood	Water type
B	Oils, Hydrocarbons, Alcohol, Greases	CO <sub>2</sub> type
C	Gases, CNG, LPG, Acetylene,	Foam type
D	Electrical & metals	Foam

##### 1.14.4.1 Recommendation

The fire tender, which will be part of project with following minimum fire fighting arrangements shall be procured:

- Water tank - 500 litres
- CO<sub>2</sub> - 2700 litres
- Foam tank - 45 litres
- CO<sub>2</sub> type fire extinguishers - 6 nos of 4.5 kg each
-

### **1.15 CONCLUSION**

**M/S. Sharayu Agro Industries Ltd. is setting up a 5000 TCD Sugar, 30 MW cogen and 60 KLPD Distillery at Kapashi, Tal Phaltan Dist. Satara . The sugar plant alongwith Ethanol plant will add more revenue to farmers. After the establishment of the factory, the standard of living of the entire area will improve. The land & other infrastructure is also available. The SAIL proposes to adopt Zero Liquid discharge, maximum recycle of water and complete utilization of waste. The impacts would be amenable to technological control and effective environmental management in both the phases (construction & Operation).**

**Based on the above, it is concluded that the adverse environmental impacts due to construction and operation phase can be mitigated to an acceptable level by implementation of various mitigatory measures envisaged.**





संक्षिप्त गोषवारा



## १.० प्रस्तावना :-

महाराष्ट्र हे औद्योगिकदृष्ट्या एक विकसित राज्य आहे. कृषी प्रधान भारत देशात साखर उद्योग हा एक अतिशय महत्वाचा उद्योग आहे. देशाच्या एकूण साखर उत्पादनामध्ये महाराष्ट्राचा वाटा सुमारे ३५ टक्के इतका आहे. ग्रामीण प्रगतीस पोषक ठरलेले उद्योग म्हणजे साखर कारखाने.

शरयू कृषी उद्योग मर्यादित हा उद्योग महाराष्ट्र राज्य शासनाच्या १९७६ च्या कंपनी कायद्यांतर्गत २१ फेब्रुवारी २०११ रोजी नोंदणी क्रं U15430PN2011PLC38601. नोंदणीकृत करण्यात आला आहे. संकलितरित्या ५००० टन प्रतिदिन गाळप क्षमतेच्या साखर प्रकल्पासोबत पर्यावरणाला अनुकूल ३० मेगावॉट सहवीजनिर्मिती प्रकल्प आणि ६० कि.लि प्रतिदिन आसवनी प्रकल्प उभारण्याचा प्रस्ताव आहे. संकलित प्रकल्पामध्ये साखर कारखान्यातून दर्जेदार साखरेच्या निर्मितीबरोबर सहविज निर्मितीसाठी लागणारी चिपाडे आणि आसवनी प्रकल्पासाठी लागणारी मळीची गरज भागवली जाणार आहे.

## २.० विवरण :-

नाव पत्ता	: शरयू कृषी उद्योग मर्यादित, कापशी, ता. फलटण, जि.सातारा
उत्पादन	: साखर, इथेनॉल आणि सहवीजनिर्मिती
अक्षांश	: १७° ५६' ३२.५०"
रेखांश	: ७४° १५' १६.५०"
महामार्ग	: मुंबई-बंगळूर महामार्ग क्र.४
रेल्वे मार्ग	: फलटण स्थानक २० किमी
जवळचे शहर	: सातारा ४० किमी
विमानतळ	: पुणे ८० किमी
पाणी उपलब्धता	: नीरा कालवा

प्रकल्पस्थानाच्या दक्षिणेला १ कि मी अंतरावर फलटण सातारा रस्ता आहे तर उत्तरेला लोणंद फलटण रस्ता अस्तित्वात आहे.

प्रकल्पस्थानाच्या १० किमी परिसरात वन्यजीव अभयारण्य अथवा पर्यावरण संवेदनशील क्षेत्र अस्तित्वात नाही.

### प्रकल्पासाठी लागणारा कच्चा माल

साखर,	ऊस
सहवीजनिर्मिती	चिपाडे, परदेशी कोळसा
आसवनी	मळी

### ३.० पाण्याची गरज :-

प्रतिदिन पाण्याच्या गरजेचे विवरण

विवरण	मी३/ दिवस
साखर	५००
ऊर्जा	६२०
आसवनी	४३२
अंतर्गत वापर	४०
एकूण	१५९२

प्रकल्पासाठी लागणाऱ्या पाण्याची गरज ही नीरा कालव्यामधून भागवली जाणार आहे.

### ४.० पर्यावरण तपासणी कायदा २००६ :-

केंद्रीय पर्यावरण व वनमंत्रालयाने १४ सप्टेंबर २००६ रोजी पर्यावरण तपासणी कायदा मंजूर केला. पर्यावरण मंत्रालयाच्या अधिसूचना दि. १४.०९.२००६ व्दारे नवीन कारखाना /प्रकल्प अथवा विस्तार यासाठी संबंधित अधिकाऱ्याकडून पर्यावरण पूर्व मंजूरी घेणे बंधनकारक असते. त्याप्रमाणे पर्यावरण व वनमंत्रालयाच्या, दिल्ली तज्ञ मूल्यमापन समितीने त्याच्या २७ - २८ जानेवारी २०१५ मध्ये झालेल्या बैठकीत त्यांचे पत्र क्रं. J-11011/373 /2013 -IA-II (I) नुसार टी.ओ.आर ला मंजूरी मिळाली. त्या मार्गदर्शक सूचनांचा अवलंब करून पर्यावरण आघात मुल्यांकन अहवाल तयार करण्यात आला.

### ५.० पर्यावरण सदयस्थिती :-

सातारा व परिसर पर्यावरण सदयस्थिती दक्षिण महाराष्ट्रातील दख्खन पठाराच्या पश्चिम भागात सातारा विभाग येतो व तो कृष्णा नदीच्या खोरे भागात समाविष्ट आहे. सातारा जिल्ह्याचे अक्षांश उत्तर १७° ५" व रेक्षांश पूर्व ७३° ३३" ते ७४° ५४" येतात.

#### भूजल उतार रचना

कृष्णा व येरळा नद्यांचा उतार दक्षिणेकडे असून मान नदीचा उतार पूर्वेस आहे तर हिरा नदीचा उतार उत्तरेस आहे कृष्णा नदी सातारा शहराच्या पूर्वेस ४० किमी अंतरावर वाई तालुक्यात महाबळेश्वर डोंगरात उगम पावते. कोयना, येरळा, वेण्णा व कुंडली या तिच्या पश्चीमेकडील उपनद्या आहेत.

#### भूस्तर योजना

जिल्हाच्या सर्वच भागात दख्खन पठार पसरलेले आहे, त्यात सखल भाग व पठारी टेकड्यांचा समावेश

आहे. सुप्त लाव्हाच्या पसरणामुळे अनेक तक्ते जमिनीत २००० ते ३५०० फुटापर्यंत आढळतात हे तक्ते महाबळेश्वर ते हेळकाक तालुका पाटणपर्यंत सापडतात.

### हवामान व पर्जन्यमान

सातारा जिल्हाचे हवामान सहनीय आहे. सर्वसाधारण ४ हंगाम आढळतात. डिसेंबर ते फेब्रुवारी हा हिवाळा मार्च ते मे उन्हाळा, जून ते सप्टेंबर पावसाळा व आक्टोबर ते नोव्हेंबर पर्जन्यपश्चात मान्सून माघार असे विभाजन आढळते.

हवा : पर्यावरण परिणाम अभ्यासासाठी प्रकल्पस्थानापासून १० किमी त्रिज्येतील भूभाग व लाभक्षेत्र निवडले आहे. हा अभ्यास डिसेंबर २०१४ ते फेब्रुवारी २०१५ या काळात प्रत्यक्षरित्या त्या ठिकाणी निरीक्षण करून माहिती व तक्ते तयार करण्यात आले. कारखान्यापासून १० किमी त्रिज्येतील प्रकल्पस्थान, कापशी, अलीजापूर, आदरकी बुद्रुक, बीबी, घाडगेवाडी, टकुबाईचीवाडी, नांदाळ येथे हवेचे नमुने घेऊन ते प्रयोगशाळेत तपासणी साठी पाठविले, त्याचे पृथःकरण खालील बाबीकारता करण्यात आले.

कार्बन मोनाक्साईड

सल्फर डायोक्साईड

नायट्रोजन डायोक्साईड

धुलीकण १० व २.५

### ध्वनी प्रदूषण

२०१४ ते फेब्रुवारी २०१५ या कालावधीत ध्वनी पातळी तपासली होती. १० किमी त्रिज्येतील ८ ठिकाणी ही तपासणी केली.

### पाणीप्रदूषण

१० किमी त्रिज्येच्या भागातील आदरकी खुर्द येथील पाण्याचे ३ नमुने प्रयोगशाळेत पाठविले होते. ते योग्य प्रमाणात असल्याचे आढळते.

### भूजल पर्यावरण

अभ्यासक्षेत्रात कुपनलिका असून त्यातील कारखाना परिसर, कापशी, टकुबाईचीवाडी, अलीजापूर, बीबी, आदरकी बुद्रुक, घाडगेवाडी व हिंगणगाव येथील कुपनलीकांचे नमुने तपासणीसाठी पाठविले. ते योग्य प्रमाणात असल्याचे आढळते.

### मृदा आणि पिके

सातारा जिल्ह्यात खालील मृदा सापडतात.

- सखल भागात काळी कसदार
- टेकडी उतार भागात मध्यम काळी

छोट्या टेकड्या व डोंगर भागात रुपांतरित

या भागात उस, ज्वारी, मका, भुईमुग, हरबरा, सोयाबीन, करडी, सुर्यफुल हि पिके घेतली जातात. तसेच केळी, डाळिंब, सीताफळ, द्राक्षे, आंबा, पपई ह्या फळांचे उत्पादन घेतले जाते.

### जैवविविधता

कारखाना क्षेत्राच्या १० कि.मी त्रिज्येतील क्षेत्रात उंबर, जांभूळ, अंजनी, हिरडा, आवळा, साग, आंबा, आपटा, डाका, चंदन, करंज, सुरु, बेल, वड, पळस, ही झाडे सापडतात. तसेच कुसलकोलंब हे गवत आढळते.

सह्याद्रीच्या रांगात व इतर डोंगराळ भागात ससा, कोल्हा, मुंगुस, तरस, साळींदर, माकड असे प्राणी सापडतात. तसेच खंड्या, कोकिळा, भारद्नाज, सातभाई, वातावत्या, साळुंकी, बुलबुल, कोतवाल, सुतार, मैना, दयाळ, विणकर, गवळण, यांसारखे पक्षी सापडतात.

अभ्यासक्षेत्रात नामशेष होणाऱ्या कोणत्याही प्राणी अथवा पक्ष्याच्या जातींचा समावेश नाही.

### सामाजिक

उत्तम हवामान, मुबलक पाणी उपलब्धता, कसदार जमीन, राष्ट्रीय महामार्ग क्र. ४ यामुळे प्रस्तावित साखर कारखाना परिसरात संचार व संपर्क यंत्रणा पूर्णपणे विकसित झाली आहे. आरोग्य सेवा, शैक्षणिक संकुले, पोस्ट, तार व दूरध्वनी केंद्र, यांचीपण वाढ झाली आहे. याचा परिणाम म्हणून येथील कामगार व इतर लोकांचे राहणीमान उंचावले असून त्यांची सर्वांगीण प्रगती उत्तरोत्तर होत आहे. राष्ट्रीय, खासगी व सहकारी बँकांची सुविधा सुरु झाल्यामुळे अनेक प्रकल्प येथील लोक सुरु करत आहेत. एकंदर येथील जनता स्थिरावली आहे.

## ६.० पर्यावरण आघात भाकीत :-

### स्थापत्यपूर्व काळ

#### हवा प्रदूषण

स्थापत्य काळात ट्रक वाहतूक, सिमेंट, बांधकामादरम्यान तयार होणारे टाकाऊ कचरा यामुळे SPM पातळीत थोडीशी वाढ संभवते. धुळीचे उत्सर्जन नियंत्रित करण्यासाठी प्रकल्प स्थानाजवळ पाण्याची फवारणी केली जाईल तसेच सर्व वाहने प्रदूषण नियंत्रित प्रमाणपत्र धारक असतील.

#### ध्वनी प्रदूषण

बांधकाम क्षेत्रात ट्रक, बुलडोजर, क्रेन यासारख्या यंत्रसामग्रीमुळे आवाजाची पातळी वाढण्याची शक्यता आहे. बांधकामात सहभागी असणाऱ्या कामगारांना सतत आवाजाचा संपर्क टाळण्यासाठी इयर प्लग पुरवण्यात येतील. सर्व कामगारांना शिरस्त्राने, सुरक्षा चष्मा, प्रथमोचार तसेच सुरक्षा संदर्भात

हस्तपुस्तिका उपलब्ध करून दिले जाईल. पण ध्वनी पातळी हि पर्यावरण मंत्रालयाच्या १४.०२.२००० प्रमाणे योग्य प्रमाणात राखली जाईल.

### **पाणी प्रदूषण**

स्थापत्य काळात ५० मी० पाण्याचा वापर स्लॅबच्या कामासाठी केला जाणार आहे

स्थापत्य काळात भूजल तसेच पृष्ठ भागावरच्या पाण्यावर कोणताही विपरीत परिणाम होणार नाही. शोष खड्ड्याद्वारे दुषित पाण्याची योग्य विल्हेवाट लावण्यात येईल

### **जैवविविधता**

सदरचा प्रकल्प हा कोणत्याही राखीव जंगलाच्या जवळ नसल्याने वनस्पती व प्राणी जीवनावर कोणत्याही प्रकारचा वाईट परिणाम होणार नाही.

धोकादायक टाकाऊ पदार्थ

स्थापत्य कामाचे वेळी कोणतेही धोकादायक टाकाऊ पदार्थ निर्माण होणार नाहीत.

### **७.० पर्यावरण संवर्धन योजना :-**

स्थापत्यपूर्तीमध्ये कामगारांना सर्व सुरक्षा साधने शिरस्त्राण, मोजे, बूट, सुरक्षा पट्टे, करणसन्नक्षक साधने देण्यात येतील. धुलीकण योग्य त्या मर्यादेत ठेवण्यासाठी पाणी फवारणी केली जाईल. तसेच योग्य त्या जागी झाडे लावली जातील. व त्यांची मशागत केली जाईल. ध्वनि पातळी योग्य मर्यादेत राखली जाईल. या कालावधीत पाणी मलनिस्सारण योजनेद्वारे स्वच्छ ठेवले जाईल.

### **८.० प्रकल्पपूर्तीनंतर :-**

चीपाडावर आधारित बॉयलरसाठी ९८.३६ % कार्यक्षमता असणाऱ्या electro static precipitator चा वापर धूळ रोखण्यासाठी केला जाईल.

स्टॅक चे उत्सर्जन नियमितपणे तपासले जाईल निशामकाची तरतूद जेथे शक्य असेल तेथे केले जाईल साखर आणि सहवीजनिर्मिती मध्ये निर्माण होणारया सांडपाण्यावर प्रक्रिया करून ते पाणी हरितपट्टा तसेच उस लागवडीसाठी वापरण्यात येईल

आसवनी प्रकल्पामध्ये तयार होणारे स्पेंटवॉश ट्रिपल इफेक्ट इव्हपोरेटर मध्ये संकेंद्रित करण्यात येईल आणि अतिरिक्त स्पेंटवॉश -स्पेंटवॉश फायर बॉयलर मध्ये वापरण्यात येईल अशाप्रकारे शून्य द्रव उत्सर्ग योजना अमलात आणली जाईल.

यासाठी महाराष्ट्र प्रदूषण नियंत्रण मंडळ सूचना आधारभूत असतील. यामुळे सद्य स्थितीतील पर्यावरणावर कोणताही आघात होणार नाही.



## ९.० प्रकल्पाचा खर्च :-

अ.नं	तपशील	खर्च लाखामध्ये			
		साखर	आसवनी	सहवीजनिर्मिती	एकूण
१	जमीन	४००	२४०	१६०	८००
२	जागेचा विकास	११२	५२	३६	२००
३	स्थापत्य बांधकाम	१८८७	१७५४	१०२०	४६६१
४.	देशी यंत्रसामग्री	८८८५	९२८१	३९१८	२२०८४
५	विविध स्थिर मालमत्ता	३९०	३५०	२२०	९६०
६	प्रकल्प पूर्व व पश्चात खर्च	९९५	९३१	४३४	२३६०
७	आकस्मिक खर्च	१९०	१८९	८७	४६६
८	खेळते भांडवल	७३०	६३	४६	८३९
	एकूण प्रकल्पाचा खर्च	१३५८९	१२८६०	५९२१	३२३७०

## १०.० आपती निवारण योजना :-

नैसर्गिक कारणांमुळे येणाऱ्या आपतीसाठी पूर्वतयारी ठेवणे हे अतिशय आवश्यक आहे. आपती व्यवस्थापन योजनेमुळे आपतीच्या वेळेची कल्पना येते व त्यासाठीच्या योजनेचे व्यवस्थापन केले जाते. अचानक निर्माण झालेल्या औद्योगिक अपघातामुळे खूप मोठ्या प्रमाणावर वैयक्तिक आणि आर्थिक नुकसानीला सामोरे जावे लागते. त्यामुळे अश्या घटनांतून होणारे नुकसान रोखण्यासाठी आपती निवारण योजनेची खूप अंशी मदत होते. आपती नियंत्रित करण्यासाठी आणीबाणी नियंत्रण कक्ष स्थापन करण्यात येणार आहे.