

## District - Satara

### Introduction

As a part of the overall preparedness of the state, the Government of Maharashtra has a State Disaster Management Action Plan to support and strengthen the efforts of the district administration. In this context, every district has evolved its own District Disaster Management Action Plan (DDMAP). It is expected that these multi-hazard response plans would increase the effectiveness of administrative intervention.

### Multi-disaster Response Plan

The DDMAP addresses the districts' response to disaster situations such as earthquakes, floods, cyclones, epidemics, off-site industrial disasters and roads accidents and fires. Some of these disasters such as floods and earthquakes affect large areas causing extensive damage to life, property and environment while others such as epidemics only affect large populations. In any case, the management of these disasters requires extensive resources and manpower for containment by remedial action.

The present plan is a multi-hazard response plan for the disasters and outlines the institutional framework required for managing such situations. However, the plan assumes a disaster specific form in terms of the actions to be taken by the various agencies involved in the disaster. The front-end or local level of any disaster response organisation will differ depending upon the type of disaster, but at the level of the back-end i.e., at the controlling level at the district it will almost remain same, for all types of disasters.

### Objectives

#### The objectives of the District Disaster Management Action Plan are :

- To improve preparedness at the district level, through risk and vulnerability analysis , to disasters and to minimise the impact of disasters in terms of human, physical and material loss.
- To ascertain the status of existing resources and facilities available with the various agencies involved in the management of disasters in the district and make it an exercise in capability building of district administration. This enables the district to face a disaster in a more effective way and builds confidence across different segments of society. It will be a positive factor for long term development of the district.
- To utilise different aspects of disaster mitigation for development planning as a tool for location and area specific planning for development in the district.
- To use scientific and technological advances in Remote Sensing, GIS etc. in preparation of this plan with a view to ensure their continuous use for development planning.
- To develop a framework for proper documentation of future disasters in the district, to have an update on critical information essential to a plan, to critically analyse and appraise responses and to recommend appropriate strategies
- To evolve DDMAP as an effective managerial tool within the overall policy framework of Government of Maharashtra.

Response to disasters, in the absence of a defined plan, would be arbitrary leading to overemphasis of some actions and absence of other actions which could be critical. The objectives of any disaster management plan should be to localise a disaster and to the maximum extent possible contain it so as to minimise the impact on life, the environment and property. A formal plan for managing disasters is therefore necessary. This would include

- a. pre-planning a proper sequence of response actions,
- b. allocation of responsibilities to the participating agencies,
- c. developing codes and standard operating procedures for various departments and relief agencies involved.
- d. inventory of existing facilities and resources
- e. mechanisms for effective management of resources
- f. co-ordination of all relief activities including those of NGOs to ensure a coordinated and effective response.
- g. Co-ordination with the State response machinery for appropriate support
- h. Monitoring and evaluation of actions taken during relief and rehabilitation

"Outline of Vulnerability Assessment" prepared by CSSD/EMC has been used as the basic instrument to collate district level information to meet the database requirements for the preparation of DDMAP.

### **Policy Statement**

The underlying policy of the DDMAP is to protect life, environment and property while ensuring mitigation of the disaster to the maximum extent possible, relief to those affected and restoration of normalcy at the earliest.

Essentially, communities draw their support from the social institutions, administrative structure, and values and aspirations they cherish. Disasters may temporarily disorganise the social units and the administrative system and disrupt their lives built around these values and aspirations. A systematic effort to put back the social life on its normal course with necessary technology support and resources will contribute significantly to the resilience of the community and nation.

This policy forms the basis of the DDMAP strategy. It aims at capacity building and prompt utilization of resources in a disaster situation through a partnership of the GOM, NGOs, Private Initiatives and the community. In pursuance with this policy, DDMAP addresses itself to strengthening the pre-disaster and post-disaster responses of various actors and stakeholders including the "victims" of the disaster.

## **OVERVIEW OF SATARA DISTRICT**

### **Location**

- Satara district is located in the south western part of the state of Maharashtra and lies between 17.5° to 18.11° North Latitudes and 73.33° to 74.54° East Longitudes.
- It is bounded on the north by Pune, on the south by Sangli, on the west by Ratnagiri, on the north-west by Raigad, and on the east by Solapur district of Maharashtra state.
- The district headquarters Satara is well connected to the state Capital Mumbai ( 260 km to the north west), and the major towns of Pune and Kolhapur by the Mumbai Bangalore National Highway No. 4.
- Satara is also well connected to other districts of Maharashtra by State highways and other roads.

· There is one railway line -Mumbai to Kolhapur- which passes through Satara district. The total distance in satara district is 124 KM.

### **Area and Administrative Divisions**

· The whole state of Maharashtra is divided into six revenue divisions ; Pune, Konkan, Nashik, Aurangabad, Amravati, and Nagpur. Satara district is part of the Pune division along with the districts of Pune, Sangli, Kolhapur and Solapur.

· Satara district covers an area of 10480 sq. km. with an east west expanse of 135 km and a north south expanse of 112 km.

· The district is divided into eleven administrative sub units (tahsils) - Satara, Wai, Khandala, Koregaon, Phaltan, Khatav, Man, Karad, Patan, Jawali and Mahabaleshwar.

<b>Sub-division</b>	<b>Tahsils incorporated in them</b>
Satara	Satara, Koregaon Jawali
Karad	Karad ,Patan
Mahabaleshwar	Wai, Khandala, Mahabaleshwar
Phaltan	Phaltan, Khatav, Man

### **Salient Physical Features and Land Use Patterns**

· The district has three natural sub-divisions based on the topographical situations - Hilly area in the west, plains of the Krishna river in the central part, and the plateau area in the east.

· Mahabaleswar is the highest place in the district and is located at a height of 1466 m above mean sea level.

### **Soil**

· Black cotton soil is the predominant soil type found here as is the case with most of the districts on the Deccan Plateau.

· Lateritic soil covers many parts of the western tahsils of Mahabaleshwar, Jawali, Wai and Patan, is typically clayey in nature and reddish in colour.

· Black cotton soil is found in the central part of the district.

· Soil fertility is especially high in the valleys of the rivers Krishna, Venna, Kudali, Koyna and Kole.

· In Khandala and Phaltan tahsils, the soil has low fertility and is rocky except for the area along the Nira river and it's tributaries.

### **Land Use Patterns**

Inhabited Area : 234 sq. km.

Agricultural Area : 7203km<sup>2</sup>

Industrial Area :

Forest Cover : 1589km<sup>2</sup>

Wastelands : 783km<sup>2</sup>

Drought prone areas : 2300km<sup>2</sup>

· Agriculture is the main land use in the district with more than 75% of the total area being used for agricultural activities.

· Forest cover is more in the western part of the district - evergreen forests have been identified on the western extremities.

### **Climate and Rainfall**

#### **Climate**

· The climate in general is moderate with temperatures during the summer months (March to mid June) reaching a maximum of 34°C, and in the winter months (November to March) dropping to 10°C.

· In the western part, the climate is pleasant during the summer, but is very cold during the monsoon.

· In the plains, the climate is moderate throughout the year.

#### **Rainfall**

· The monsoon period starts in the month of June with the maximum precipitation in July and August.

· Total rainfall is 3104 mm although there are large differences in the amount of precipitation over various parts of the district.

· The Sahyadri hill ranges -chiefly in Mahabaleshwar tahsil -in the western extremity receive more than 6000 mm. Patan and Jawali tahsils also have rainfall in excess of 2000 mm.

· Moving eastwards the rainfall amount drops to less than 600 mm in the tahsils of Koregaon, Karad, Satara.

### **Socio-Economic Features**

#### **Demographic Features**

According to the 2001 census, the demographic features in Satara district are as follows :

Total number of households : 4,65,891

Total Population : 28,08,994

Total male population : 16,08,000

Total female population : 12,00,994

Sex Ratio : 1029

Urban Population : 5,16,424

Rural Population : 22,34,576

#### Percentage of urban

population to total population : 12.91%

Population Density : 233

Literacy rate : 66.67%

Male Literacy rate : 80.61%

Female Literacy rate : 53.35%

#### SC/ST

SC Percentage : 9.51%

ST Percentage : 0.75%

#### Urban and Rural Locations

##### Urban Locations

Sr. No	Name	Population(1991)	PopulationDensity	Major Occupational
1	Satara	95,180	11,897	Not available
2	Wai	26,289	6,500	-do-
3	Rahimatpur	14,585	1,458	-do-
4	Phaltan	44,367	4,000	-do-
5	Mhaswad	18,000	1,004	-do-
6	Karad	56,819	28,500	-do-
7	Mahabaleshwer	10,564	1,056	-do-
8	Panchgani	10,569	1,060	-do-
9	Koregaon	19,733	844	-do-
10	Satara Road	9,522	484	-do-

11	Patan	10,179	5,253	-do-
----	-------	--------	-------	------

#### Major Rural Centres (population more than 10,000 )

Sr. No.	Name of the Rural Centre	Population	Population Density	Major Occupational Patterns
1	Kodoli	10,726	957	Agril. 7 %, Others64 %
2	Lonand	12211	1,051	Agril. 5 %, Others 66.17%
3	Dahiwadi	11,312	817	Agril .10%, Others 4.71%
4	Vaduj	11,218	1105	Agril.8%, Labour 5%, Others61%.
5	Umbraj	12,451	1,245	Agril.4%, Land8%, Business 5%, Others 58%
6	Rethare Bk.	15,707	1,570	Agril . 8%, Land 21 %, Others 53 %.
7	Vanwadi	11,392	1,130	Agril. 3 %, Land 6%, Business5%, Others 61%.

#### Historical and Religious Centres

Information on historical centres is compiled to assess the possible influx of large populations on specific occasions and the service demands generated. This is important specifically with respect to the administration's response for management of transport, health services, law and order, facilities for food and sanitation in order to control epidemics, road accidents and fires.

Sr.No.	Name of the Historical and Religious Centre	Periods of Festive Occasions, Months	Estimated tourist or visiting population
1	Aundh	Jane. /Feb.	25,000
2	Kinhai	Jane. / Feb.	10,000
3	Bahule	Feb. / March	1,000
4	Banpuri	March / April	20,000
5	Bavdhan	Feb./ March	15,000
6	Chafal	March / April	20,000
7	Chimangaon	Feb.	1,000
8	Dhawadshi	Feb.	5,000
9	Dhom	April / May	1,000
10	Diwash	March/April	1,000
11	Khatav	July/Aug.	5,000
12	Khatavun	March	50,000

13	Kole	Jan/Feb	10,000
14	K.M war ,	Feb/March	30,000
15	Mandhardewi	-	40,000
16	Mhaswad	Nov/Dec.	1,40,000
17	Pal	Dec/Jan	1,00,000
18	Sajjangad	Feb	15,000
19	Phaltan	Nov/Dec	50,000
20	Pusegaon	Dec	1,75,000
21	Singnapur	March/April	1,00,000
22	Anewadi	April	50,000
23	Masur	Feb	1,000
24	Hiware	April	1,000

### Seasonal Migration

Purpose	Area (specify Talukas)	Period (Calendar Months)	Estimated population in/outmigration
Sugar cane Cutting	All parts of Satara tahsil	Oct. / April	5,000 Approx
Sugar cane Cutting	Koregaon	Oct. / April	4,000 Approx
Sugar cane Cutting	Karad	Oct./ April	3,000 Approx
Sugar cane Cutting	Patan	Oct./ April	7,000 Approx
Sugar cane Cutting	Phaltan	Oct./ April	8,000 Approx
Sugar cane Cutting	Vaduj	Oct./ April	2,000 Approx
Sugar cane Cutting	Wai	Oct./ April	4,500 Approx
Sugar cane Cutting and Labour	Khandala Part	Oct./ April	7,500 Approx
Sugar cane Cutting and Labour	Man	Oct./ April	9,000 Approx

### Agricultural and Cropping Pattern

Types	Names	Cropping Period in Months	Market District, State, Export)
Major Crops (Irrigated)	Rice, Cotton, Wheat, Gram, Sugarcane	5 to 6 months (Except Sugar cane)	District State

	Sugarcane, Groundnut		
Major Crops (Non Irrigated)	Bajra, Kharif and Rabi Jawar Groundnut	3 to 4 months	- do-
Major Cash Crops	Cotton and Sugar	3 to 6 months	-do-
Major Plantations	Fodder Development and Mixed planting	Every Year	-

## River Systems and Dams

### Dams

- There are two main river basins in the district - Bhima basin covering 30% of the district in the north eastern part and the Krishna basin over the remaining part.
- Krishna is the main river in the district - emerging from east of Mahabaleshwar plateau and after traversing a distance of 160 km flows into Sangli district.
- Main tributary is Koyna, which also originates near Mahabaleshwar, flows in a north-south direction till Helwak and then turns east-west and joins with the Krishna.
- The other tributaries of the Krishna are Kudali, Venna, Urmodi, Tarli, Yerla, and Wasna.
- Nira forming the northern boundary of the district and Man are the tributaries of the Bhima river.

### Dams

There are three major dam projects in the district : Koyna Dam on the Koyna River, Dhom Dam on the Krishna river and Kanher Dam on the Krishna river.

### Major Dams in the District :

Sr. No.	Name of Dam	Taluka	Capacity of the Dam in TMC.	No. of Gates
1.	Koyna.	Patan	105	6
2	Dhom	Wai	13.50	5
3	Kanher	Satara	10.10	4
4	Veer	Khandala	8.66	6
5	Dhom Balkawdi	Wai	4.08	3
6	Urmodi	Satara	9.80	4
7	Morna Gureghar	Patan	1.83	3

	<b>Gureghar</b>			
8	<b>Tarali</b>	<b>Ptan</b>	5.85	3

### Irrigation Projects

<b>Sr.No</b>	<b>Location of Projects</b>	<b>Catchment area in Sq.Km.</b>	<b>Target command are Sq. km</b>
1	Nagewadi Med. Project	11.91 Sq. km	1560 Hector
2.	Wang Medium Project	73.34 Sq. km	6200Hector
3	Morna (Guregaon) Medium project	55.94 Sq. km	3806Hector
4	Uttamand Med. Project	43.69 Sq. km	4800 Hector
5	New Gate Khodashi	Remodeling work	-
6	Dhom Balkawadi Dam at Balkawadi	42.77 Sq. Km	217 Sq. m
7	Kudali Project (I) Mahu	28.62 Sq. Km	17
	(ii) Hatgeghar	7.17 Sq. m	1.4
8	Urmodi Dam at Parali	116.86 Sq.Km	277.50
9	Tarali Dam	81.45 Sq. Km	220.25

### Power Stations and Electricity Installations

#### Industries

The extent of industrialisation is reflected in the number of industrial estates and the industrial activity in terms of movement of cargo.

#### Extent of Industrialisation

<b>Numberof IndustrialEstates</b>	7
<b>Type of Industries</b>	Plastic, Chemical, Rubber based industries
<b>Total Workforce in industries</b>	31 500

<b>No. of chemical Industries and Industries Tank farms</b>	35 Chemical units
<b>No. of Pipelines carrying chemicals</b>	Nil
<b>No. of Potentially Hazardous Locations</b>	5 Chemical units
<b>No. of Vehicles carrying hazardous Raw materials for industries (during a month)</b>	30 to 50 per day
<b>No. of Vehicles carrying hazardous finished products from industries (during a month)</b>	180 Vehicles
<b>No. of Vehicles passing through the district carrying hazardous materials for industries (during a month)</b>	30 to 50 Vehicles per day
<b>No. of container terminals</b>	Nil

The details of each industrial estate and the fact sheet of each hazardous industry have been attached in Annexure.

#### **Transport and Communication Network**

##### **Transportation Network**

<b>Number of National Highways</b>	1
<b>Length (in km) of National Highways</b>	130 Kms.
<b>State Highways (in Kms)</b>	939 km.
<b>Z.P roads (in km)</b>	7721 km.
<b>No of bridges on river</b>	48 Nos.
<b>No of S.T. Depots</b>	11
<b>No of villages not accessible by S.T.</b>	N.A.
<b>Number of ports or jetties</b>	- -
<b>Number of boats</b>	60

No of railway stations with mail/express halts.	5
No of railway bridges	10
Non-electrified railway routes(in km)	124 kms
Electrified railway routes (in km)	Nil
Number of un-manned railway crossings.	25
Number of Airports/ air strips.	2

### Communication

- Upto end of 1994-95, there were 698 post offices and 191 telegraph offices in the district.
- There is a low power transmitter for Doordarshan, another one for AIR (FM band) service.
- Dish antennas have also proliferated throughout the district.

### Proposed Development

New Afforestation : 4 sq. km. per year

### Town Development Schemes Proposed

Number of new town development schemes undertaken proposed	Location of the town Development scheme	Area in Sq. km.	Nearest Urban/ major Rural centre
Satara	Entire municipal limit	8.16	Satara
Karad	-do-	2.46	Karad
Phaltan	-do-	10.62	Phaltan
Mhaswad	-do-	88.19	Man
Rahimatpur	-do-	31.83	Koregaon
Mahabaleshwar	-do-	145.04	Mwar
Panchgani	-do-	6.16	Mwar
Wai	-do-	3.63	Wai
Koregaon	-	23.28	Koregaon
Lonand	-	28.26	Khandala

**Large industries set up or proposed.**

<b>Sr.No.</b>	<b>Name of the Industries</b>	<b>Location of the industries.</b>	<b>Type of Industries.</b>
1.	Jarandeshwar S.S.K Ltd.	Chimangaon, Tal. Koregaon Chimangaon/Koregaon Dist. Satara	Sugar factory
2 .	The Indian Card clothing Co. Ltd.	Khandala, Wing, Shirwal Dist. Satara.	Textile factory
3.	Ajinkyatara Sahakari Sut Girani Ltd. Shahunagar, Shendre, Satara	Shahunagar, Shendre, Satara	Cotton, carded
4.	Tuljabhavani Devi Sahakari Sakhar Karkhana Ltd. Phaltan.	Rajuri, Phaltan, Satara.	Sugar factory
5.	Kisan Veer Sahakari Sakhar Karkhana Ltd.At & Post. Khandala	Khandala Satara	Sugar Factory
6.	Samarth Ramdas Swami SPG Mills Pvt Ltd. Khindwadi, Satara	Khindwadi, Satara	Cotton, Carded
7 .	Maharashtra State Ele.Board	Koyna Satara	Hydro-electricity .
8 .	Bharat Starch Chemical ltd.	Karad, Satara	Citric Acid Factory.
9 .	Rayat Sahakari Sakharana Maryadit,Kolewadi, Karad, Satara	Kolewadi, Karad, Satara.	Sugar Factory
10.	Pratapgat Sahakari Sakhar Karkhana Ltd., Kudal,Tal. Jaoli, Satara	Kelghar, Jaoli, Satara	Sugar Factory

**RISK ASSESSMENT AND VULNERABILITY ANALYSIS****Economic, Occupational, Social and Educational Profile of the Population****Economy**

• Agriculture is the main economic activity in the district with 63.5% of the total land under agriculture.

“ In general agriculture activities are less in the western tahsils due to hilly terrain with Mahabaleshwar tahsil having only 1% land under agriculture, most of the area being forest land.

“ The eastern tahsils of Khatav and Karad each have about 75% land under cultivation.

- Double crops are cultivated over about 80% of the land under agriculture - along the flows of rivers Krishna, Koyna, Nira, Yerla double crops are taken.
- Cereals dominate the crops in all tahsils.
- There are three harvesting seasons, Kharif, Rabi and Summer.
- “ During the Kharif season, food crops like Bajra, Jowar, Nachani, Warai and cash crops like ground nuts and rarely sunflowers are harvested.
- “ During the Rabi season, Jowar, Wheat and Gram are harvested.
- “ During the summer season, wherever water for irrigation is available, maize, ground nuts, sunflower, vegetables are grown.

### **Social Profile**

- Out of the 24.45 lakhs population (1991 census), 87% lives in rural areas.
- “ 53.19% of population is below poverty line and there are 33% illiterates in the district.
- “ Wai and Javali tahsils have the largest percentage of households among their population below the poverty line.
- “ SC\ST account for about 10% of the total population.
- “ Karad is the most densely populated tahsil with 470 persons/sq. km., while Man is the most sparsely populated with 127 persons per sq. km.
- “ Satara and Karad are the two major urban centres.

### **Educational Profile**

- Educational facilities span the whole range from Anganwadis to professional degree colleges.
- “ There are 1556 pre-primary and primary schools, 279 secondary and Higher secondary schools and 7 degree colleges.
- “ There is a public school at Pusegaon, Engineering college at Satara, ITI etc.
- The district has a fairly well developed transport and communication systems.
- “ Railway network is limited to the Pune-Satara-Kolhapur railway line (124 km long) which carries passenger as well as goods traffic.
- “ Road network is good, 130 km of the National Highway No.4 passes through the district; there are 939 km of State highways and 7721 km of other district roads.
- “ The State Transport has a well spread out network of bus services.
- “ More than 1547 villages have access to telephone facility.

There is a low power Doordarshan transmitter making Doordarshan accessible to almost all villages; there is a low power All India Radio transmitter for FM band. Dish antennas have also proliferated throughout the district.

All taluka headquarters are linked to the district headquarters by wireless, telephone and fax.

### **Disaster Specific Proneness**

#### **Floods**

- There are two main river basins in the district - Bhima basin covering 30% of the district in the north eastern part and the Krishna basin over the remaining part.

Krishna is the main river in the district - Main tributary is Koyna, the other tributaries being Kudali, Venna, Urmodi, Tarli, Yerla, and Wasna.

Nira forming the northern boundary of the district and Man are the tributaries of the Bhima river.

- The monsoon period starts in the month of June with the maximum precipitation in July and August.

Total rainfall is 3104 mm although there are large differences in the amount of precipitation over various parts of the district.

The Sahyadri hill ranges -chiefly in Mahabaleshwar tahsil -in the western extremity receive more than 6000 mm. Patan and Jawali tahsils also have rainfall in excess of 2000 mm.

Moving eastwards the rainfall amount drops to less than 600 mm in the tahsils of Koregaon, Karad, Satara.

- Since all the major rivers originate in the high rainfall Western Ghat area, flooding due to excessive rainfall during the monsoon is a natural corollary.

- 16.05 % of the population lives in flood prone areas with the major rivers Koyna, Krishna, Venna, Yerla, Veer etc showing flooding atleast once a year during the monsoons.

- Release of excess water from the dams on the major rivers causes flooding in villages lying along the river course in Patan, Khandala, Satara, Karad tahsils.

- The Koynanagar Dam on the Koyna river has contributed to reducing the vulnerability of many villages in Karad tahsil to flooding

- Past incidences of flooding :

Occurrence of Floods in the last 30 years (heavy rains) HeavyRains Flood

Number of deaths due to Floods 22 8

Total Loss due to Floods (in Rupees) 8765 -

Expenditure incurred on Relief and Rehabilitation during last 161 3

thirty years on these episodes (in Rupees)

The following table gives an assessment of the flooding frequency of major rivers in the district

Sr.No.	Name of the River	Flooding frequency over years.	Location and Extent of Area inundated (worst case)	Corresponding Estimated Flood Damage in Rs.
1.	Krishna	Once in a year		
2.	Urmodi	Once in a year		
3.	Tarali	Once in a year		
4.	Yerala	Once in a year		-
5	Moma	Once in a year		-
6..	Vasana	-		-
7.	Koyana	No floods		-
8	Venna	No floods since 1986-87		-
9	Wang	Once in a year		-
10	Nira	Once during last 2 years.	Max 1902.40ft on 4-10-96	-

• **Preventive and preparedness measures have been taken to reduce damage due to floods.**

“ There are 11 Rainfall Monitoring Stations and 14 Flood Monitoring Stations in the district. (Details in Annexure)

“ It is observed that flood hazards are mainly caused by illegal encroachments and hutments on the river-sides, much below the danger-point levels.

“ When releasing water from dams, advance warning is given to villages in downstream areas for proper evacuation to safer places.

“ High Flood Level has been marked on the banks of Krishna, Kanher and Veer rivers and no settlements are allowed in flood prone areas.

“ Control room functions round the clock in the Collectorate during the monsoons and all district heads,tahsildars, SDOs and BDOs are advised to be alert.

“ Preventive measures like reforestation of denuded forest , land treatment like contour bunding , protection of watershed from fires, control over deforestation, create small bandharas(Kolhapur type) ,construction of flood walls in the banks of the rivers etc may be taken up.

**Earthquakes**

• The district administration has ranked earthquakes at number one in terms of past occurrences and has indicated a high probability for future occurrences.

• This is mainly due to the high incidence of seismic activity in the Koyna valley which also was the epicentre of the famous 1967 Koyna earthquake - the strongest seismic event after the 1993 Killari earthquake.

- In the 1967 quake, 161 lives were lost , damages and repairs and reconstruction cost to the houses and the dam ran to several crores of rupees.

- Reservoir Induced Seismicity (RIS) seems to be the likely cause of the seismicity in this area.

- Earthquakes have been recorded here from 1963 and till 1997 more than 95000 tremors have been recorded.

- Even presently about 2- 3 tremors ,albeit of very small magnitude, per day is a common occurrence.

- No other part of the district has reported any seismic activity although the 1993 Killari earthquake caused some damage.

- Seismic observatories are at Koynanagar , Mahabaleshwar and Satara.

- The Koyna and dam and it's backwaters - the principal epicentral area for the seismicity- fall mainly in Patan tahsil and the southern part of Wai tahsil.

.. These two are comparatively bakward districts with some parts of the Koyna valley in Patan tahsil still being inaccessible by road.

.. In the Koyna valley, agricultural activities are rare, and most of it is forest land. and industrialisation is negligible

.. Hence the regular tremors of magnitude 2 to 3 are not strongly felt outside the district ; slightly larger tremors do cause some minor damage to houses in parts of the valley.

A comprehensive study aimed at asesssing the risk of major seismicity is necessary especially since this area is very close to the Western Ghat Fault(?) scarp.

A major earthquake here of magnitude more than 6 could cause substantial damage not only in Satara district but also in the neighbouring more industrialised districts of Pune and Kolhapur.

**The seismic data of the Koyna region since 1963 is given in the following table :**

Sr.	Year	No. of shocks as per magnitude				Total	No. of
		< 3	3 < 4	4 < 5	5		
1	1963	9	4	-	-	13	-
2	1964	246	16	-	-	262	-
3	1965	153	16	-	-	169	-
4	1966	137	15	-	-	152	-
5	1967	4800	228	18	3	5049	-
6	1968	8396	151	10	1	8558	-
7	1969	3252	58	4	-	3314	-

7	1969	3252	58	4	-	3314	-
8	1970	2472	31	4	-	2507	
9	1971	1773	56	4	-	1833	105
10	1972	1659	46	-	-	1705	80
11	1973	2151	30	-	1	2182	108
12	1974	2719	52	2	-	2773	43
13	1975	1476	45	1	-	1522	44
14	1976	2206	38	1	-	2245	48
15	1977	2606	24	1	-	2631	30
16	1978	2587	24	1	-	2612	29
17	1979	3230	25	-	-	3255	24
18	1980	7933	133	5	-	8071	124
19	1981	3434	43	-	-	3477	43
20	1982	3289	19	2	-	3310	29
21	1983	3211	37	2	-	3250	35
22	1984	2219	12	2	-	2233	18
23	1985	2356	31	-	-	2387	14
24	1986	2529	11	-	-	2540	26
25	1987	3739	12	-	-	3751	21
26	1988	3491	15	1	-	3507	27
27	1989	1984	10	1	-	1995	17
28	1990	2119	11	-	-	2130	14
29	1991	2179	14	2	-	2195	27
30	1992	2764	10	-	-	2774	15
31	1993	5005	39	5	1	5050	38
32	1994	3771	48	-	1	3820	64
33	1995	2053	29	2	-	2084	37
34	1996	1364	29	1	-	1394	29
35	1997 till Årr)	385	8	-	-	393	5

Total	93697	1370	69	7	95413	1094

### Road Accidents

- The district administration has ranked road accidents at second spot on the basis of past incidences and has indicated a medium probability of future occurrence.
- There is an extensive network of roads throughout the district ; 130 km of the Mumbai -Bangalore National Highway No.4 passes through the district ; there are 939 km of State highways and 7721 km of other district roads.
- Three major accident prone spots have been identified by the district authorities
  - “ The stretch of the National Highway between Shirwal and Karad is the most accident prone part of the highway - more than 600 people have died till present.
  - “ The Khambatki ghat section of the highway is also prone to accidents due to the narrow road and tunnel - proposal for widening the tunnel and four laning of the highway is under consideration.
  - “ Near Satara City, where the National Highway crosses the State highways, there is frequent problem of traffic jams and accidents - an overhead bridge is required.
- More than 30 to 50 vehicles pass through the district carrying diesel, petrol and other inflammable materials.
- Satara and Karad, major towns on the NH4, have significant number of industries which receive hazardous materials.

### Epidemics

- Epidemics are common throughout the district during the monsoon period, as in many other districts in Maharashtra.
- The common cause for the outbreaks are polluted water and contaminated food.
  - “ There are 957 villages without piped water supply and depending on wells, lakes and rivers.
  - “ Gastro-enteritis, Cholera, Dysentery, Pneumonia, Jaundice, Typhoid, Diarrhoea etc. are the common diseases.
  - “ During the summer season, there is an increase in the cases of food poisoning
  - “ In the last 10 years, there have been 93 cases affecting 3349 people and resulting in 5 deaths.
  - “ The culprit in such cases is unhygienic conditions in dhabas and small hotels.
- In the past 30 years there have been 425 instances of epidemics resulting in 262 deaths.



and Destruction of property							
Damage to Cattle and livestock	Low	Low	Low	Low	-	Low	Low
Damage to subsistence and crops	Low	Medium	Low	-	-	Low	-
Disruption of life style	Low	Low	Low	-	-	Low	Medium
Disruption of Community life	Low	Low	Low	-	-	Low	Low
Loss of livelihood	Low	Low	Low	-	-	-	Low
Disruption of services	-	-	-	-	-	-	-
Damage to infrastructure and/or disruption of Govt. system	Medium	Low	Low	-	-	Low	Low
Impact on National Economy	Medium	Low	Low	-	-	Low	Low
Social and psychological after effects	-	-	-	-	-	-	-

**SPECIFIC VULNERABILITY OF SYSTEMS AND SERVICES TO DISASTER EVENTS**  
Vulnerable to

<b>Specific Vulnerability of</b>	<b>Earthquake</b>	<b>Floods</b>	<b>Cyclones</b>	<b>Epidemics</b>	<b>Fire</b>	<b>Road accident</b>	<b>Industrial and chemical accidents.</b>
Transport Systems (Road network)							
Transport system (rail network)							
Power supply							
Water supply							

Sewage							
Hospitals							
Food stocks and supplies							
Communication Systems (Tele communications.)							

### RANKING AND PROBABILITY OF DISASTER EPISODES IN THE DISTRICT

Event	Ranking of events in terms of past occurrence	Probability of future occurrence		
		High	Medium	Low
Earthquake	1			
Floods	3			
Cyclones	4			
Epidemics	5			
Industrial and Chemical Accidents	6			
Fires	7			
Road Accidents	2			

#### Episode 1

This study is about the floods that struck Satara district during 23rd to 25th August 1997.

Before construction of the Dams at Koyana, Dhom, Kanher, Bhatghar(Veer) there were threat of floods in the down-stream villages in the western part of the district, but since the Dam construction work has been completed the likelihood of danger of floods is reduced to a great extent.

However, the Irrigation Department have prepared a plan for flood monitoring Stations ( River Gauging Stations ) on these major rivers and flood marks have been erected on the both bank sides of the rivers, in order to alert the people residing in the red mark zone during the monsoon period. Rainfall Monitoring Stations on these major rivers like Koyna etc are functioning during monsoon season.

During the current monsoon season of 1997, the Monsoon started in time in the western part of this district, and it was normal in the month of June and July and due to the continuous rains in the catchment areas of the major rivers, the all major Dams were filled up completely nearby 15th August 1997 as it will be seen from the following statistical data :-

Sr. No.	Name of Dam	Storage Capacity M M 3	Actual Storage as on 15-8-97. M M 3
1.	Koyana Dam	2795.45	2652.00
2.	Dhom Dam	382.32	358.93
3.	Kanher Dam	286.00	262.58
4.	Bhatghar Dam	672.48	664.34
5.	Veer Dam	278.39	267.80

In the last week of the August 1997, the low depression took place in the Bay of Bengal and it was moving in North-West directions and after that an advance intimation of heavy rains was given by the Meteorological Department to this District for taking the precautionary measures to meet the situation if arises etc.

Accordingly the heavy rain started from the mid-night of 22nd August 1997 and continued upto 26th August 1997 in the catchment area of the major Dams, with the result that a large quantity of excessive water from the Dams were released in to the down stream rivers, which were flooded, and caused a damage to the property,crops and roads etc. The statistical data about rainfall (during the period from 23-8-97 to 26-8-97) received, is as follows :-

Sr. No.	Name of Tahsils	Rainfall Received on (in M.M.)			
		22/8 25/8	23/8	24/8	
1.	SATARA	10.5 34.0	94.1	22.0	
2.	KARAD	2.9 7.0	69.1	22.0	
3.	PATAN	19.0 51.0	128.8	63.6	
4.	JAOLI	12.4 78.2	195.8	59.0	
5.	MAHABLESHWAR	116.8 116.5	366.1	114.7	
6.	KOREGAON	4.1 7.02	63.4	16.8	
7.	WAI	4.8 116.4	142.2	17.0	
8.	KHANDALA	-	50.4	8.0	6.2
9.	PHALTAN	-	18.8	1.0	-
10.	VADUJ	1.5	19.6	1.8	1.1
11.	DAHIWADI	-	6.0	2.0	-

**Shifting of families to safer sides :-**

Due to the heavy floods in the major rivers, the families residing on the bank of the rivers were shifted to safer side by the Revenue Machinery, on receiving floods in that area.

**The details of the families shifted to the safer sides is as under :-**

Sr.	No.	Name of Tahsil	No. of families shifted to Safer Site.
1.	PATAN	19 families	
2.	MANDRUL	5 families	
3.	KARAD	23 families ( 102 members )	
4.	GOTE	12 families ( 84 persons )	
5.	CHACHEGAON	10 families	
6.	JADHAVVASTI	150 persons	
7.	WAI	40 families	
8.	ARALE	19 families	

As soon as flood in over/reduced these families were returned in their houses along with the material for living as usual.

**Release Of Excessive Water From The Dams :-**

The Major Dams were filled up due to the continuous rains as mentioned in the previous paragraph and as such the Excessive Water from the following dams were released for the safety of the Dams, in the down stream villages, which caused a damage to the Property and Crops road etc due to floods.

Sr. No.	Name of the Dams	Quantity of released water from the Dams in (Cusecs)			
		22/8	23/8	24/8	25/8
1.	Koyana Dam	-	1,10,000	92,558	97,835
2.	Kanher Dam	6,180	20,000	8,231	4,715
3.	Dhom Dam	17,620	24,000	10,578	5,877
4.	Veer Dam	22,861 4,181 } 1,18,466	68,376 } 41,524	56,944 } 64,781	

**Damage To Infrastructure :-**

Due to the floods in the major rivers, the following bridges from the western areas, were submerged under the flood water, which disrupted the communication on this bridges for 2-3 days, which caused inconvenience to the peoples from that areas.

<b>Sr. No.</b>	<b>Name of Bridge</b>	<b>Name of rivers on which this bridge is in existence.</b>
1.	Morgiri Bridge	Koyana River
2.	Helwak Bridge	- do -
3.	Mandrul Haveli	- do -
4.	Nisare-Marul Haveli	- do -
5.	Krishna Bridge	Krishna river near Karad City
6.	Tambve Bridge	- do -
7.	Nira-Lonand Bridge	Nira River

During the course of the survey it was observed that the following villages were covered by the flood water and as such the normal contact and communication facilities by road were cut down, which caused very inconvenience to the families residing in the following villages. The details of the same is as under :-

1] WAI TAHSIL = i) Kawathe - 679 families

2] KARAD TAHSIL = i) Tambve - 934 families

ii) Dushere - 447 families

iii) Shere - 652 families

iv) Khodashi - 563 families

v) Sathe - 15 families

vi) Mandrul Haveli - 5 families

3] PHALTAN TAHSIL =

i) Gokhali } \_\_ 4 families

ii) Jadhav-vasti}

As soon as the intensity of rain fall is reduced, the river floods were reduced to great extent and the normal situation took place by 27th August 1997.

**Loss Of Life :-**

It was noticed that due to the heavy rainfall, a house of Shri. Sakharam Jagannath Mane from Wathar (Kiroli) was collapsed on the body of some persons, who lost his life in this natural calamity on 23-8-1997.

The rainfall received during 24 hours was 63 M.M..

**Assessment Of Administrative Preparedness :-**

Before commencement of the Monsoon, the meeting of the all concerning Officers were conveyed by the Collector and in that meeting a detail review in regards to the preventive and precautionary measures were taken in it. Accordingly this various Government authorities Viz:- Revenue authority, Zilla Parishad and Irrigation Department have taken adequate steps at the time of the floods in the major rivers, due to the release of excessive water from the Dams to minimise the loss of human life in the floods.

**Procedures Followed For Assessing Of Various Type Of Damages And Compensation Norms Used :-**

After this flood disaster, the Collector had issue instructions to the sub-ordinate Revenue Machinery to formed a teams to assess the damage caused due to the heavy rainfall and floods in the Western part of the district. Accordingly the Revenue Machinery has completed the detailed survey of the damage caused to the property, crops and animals village wise and this has been reported to the Collectorate Satara for onwards transmission to the Government. In addition to this the Irrigation Department and Executive Engineer, B.& C. , Z.P. has also assessed the damage due to the floods to the roads and other property belonging to their department.

**Relief And Compensation :-**

In the aforesaid natural disaster of floods and heavy rains the total loss to the property,crops and others are worked out by making the assessment by the concerned department, which is as under :-

**LOSSES :-**

A]

- 1) No. of affected villages :- 538 villages
- 2) No. of affected families :- 3344 persons
- 3) No. of affected persons :- 13124 persons
- 4) No. of dead persons :- 1 Nos.
- 5) Partially affected houses :- 1923 Nos.
- 6) Completely damaged houses :- 6 Nos.
- 7) Total damage to the houses :- Rs. 47,38,990 ( Partially affected )Rs. 1,70,600 ( Fully affected )
- 8) Damaged to Cattle Shed :- 5 Cattle Sheds
- 9) Total loss to the Cattle shed :- Rs. 23,600/-
- 10) Dead Sheeps : - 11 Nos.
- 11) Total loss of dead Sheeps :- Rs. 6,700/-

12) No. of the animals dead :- 10 Nos.

13) Total loss due to this :- Rs. 56,150/-

#### **BJ INFRASTRUCTURE**

1) Damage to Road and Bridges :- 250 Roads & 234 Bridges.

2) Total loss to Road and Bridges damage :- Rs. 9,06,73,500/-

#### **CJ CROP DAMAGE**

1) No. of Khatedars affected :- 4,812 Nos.

2) No. of hectares damaged :- 1249.14 hectares

3) Total loss occurred due to heavy rains and floods :- Rs. 7,45,1121 /-

DJ MUNICIPAL ROADS DAMAGE :- Rs. 27,55,000/-

EJ

1) Loss to Private property :- Rs. 11,31,500/-

2) No. of Properties affected :- 69 Nos.

District Collector, who has visited the flood affected area and also she has supervised the damage assessment operations in Patan and Karad tahsils.

Government have increased in the rate of gratuitous aid from Rs. 450/- to Rs. 600/-.

#### **Conclusion :-**

It is equally important to train volunteers in every village so that relief reaches to the needy people without delay .

In order to protect the flood prone areas, it is therefore, suggested that treatment like reforestation of denuded forest, land treatment like contour bunding, protection of water shed from fires, control over the deforestation, create small bandharas ( Kolhapur Type) on construction of flood walls in the banks of the rivers etc may be taken up.

It is observed that flood hazards are mainly caused by illegal encroachments and hutment's on the river side, much below the danger point levels. Strict action needs to be taken even in normal times to ensure that such encroachments are removed from the river banks and fines should be imposed on illegal shelters to discourage the encroachments and also clear cut notice needs to be given to the encroacher to shift at their own cost to the safer side. If they fails to shift from the river beds to safer sides, the relief can not be given at all in case of floods in near future.

Irrigation Department could have calculated the likely quantum of discharge in to the rivers and intimated to the Civil Administration about it at least five hours in advance, so that the Revenue machinery will be in a position to communicate this message to the river sides villages for the proposed threat of floods in the village.

During the current year 1997, the Dams were filled up completely and with the result that a large quantity of excess water from the dams were released from these 5 Dams in to the down stream of Koyna, Krishna, Kanher, Nira rivers, which resulted in flooding of river banks in the downstream areas. Some encroachment and unauthorised constructed houses on the banks of the rivers were submerged for short period.

In order to avoid the loss of property and human life in the flood hazards, it is suggested that the following points needs to be emphasised in the mind of the people.

- i) Peoples residing on the banks of rivers in the red zone (flood lines) should shift to the safer sides.
- ii) Irrigation Department, should give an advance intimation of the release of excess water from the Dams, well in advance in future.
- iii) The N.G.O's should take active part in training the villagers about the consequences of the flood damages.
- iv) Health Department should take immediate steps to provide medical facility after the flood to the affected people.
- v) M.S.E.B. should restore the light connection after checking the electrical lines after the floods.
- vi) Agril. Department should provide the seeds for resowing operation, in case the crops are washed away in the floods.
- vii) B. & C. Department should take immediate steps to repairs the roads and bridges damaged in the flood for communication as normal on priority basis.
- viii) Police Department should keep vigilant watch on the flood situation and alert the people at the time of flood hazards.
- ix) Irrigation Department should keep the flood monitoring centres vigilant during the rain season.

**Episode no. 2**

· Type of Episode	Flood (Wang River)
· Location	River ganging site at Ghudhe, Tal. Patan.
· Date	4-10-1996.
· Reasons assigned for the event.	Heavy rainfall in Wang Valley at about 180 M.M
· Warning system used.	Special messenger
· Community response to warning system.	-
. Administrative response to warning system.	Good
· Assessment of administrative preparedness.	Good
· Area affected(number of villages)	-
· Extent of damage	Water stage recording well and machine

· No of lives lost	Nil.
· Crop damage	Nil.
· Damage of houses	Nil.
· Loss of cattle	Nil.

Irrigation department has prepared and submitted the plans and estimates of the structure and machinery to higher authorities for sanction.

### Episode no. 3

· Type of Episode	Tarali River (Flood)
· Location	River gauging Station at Ambale, Tal.Patan
· Date	9-6-1991
· Reasons assigned for the event	Heavy rainfall in Tarali valley 177 mm rainfall.
· Warning systems used.	Special messenger
· Community response to warning system.	No damage to community
· Administrative response to warning system.	Good
· Assessment of administrative preparedness.	Good
· Area affected( No of villages)	1 ( PAL )
· Extent of Damage:-	2 Towers machine Compound walls. Wire rope, switch shed Rs.3,66,000
* No of lives lost :-	Nil
· Crop damage	Nil.
· Damage of houses	11, Rs. 2,62,900.
· Loss of cattle	38, Rs.3,39,740.
· Damage to infrastructure	
· Procedure followed for assessing various types of damages and compensation norms used.	Panchanamas were made and as per and rules the compensation were paid to the sufferers.
· Department wise break up of the expenditure incurred on relief and rehabilitation.	Revenue Dept has incurred an expenditure on rehabilitation as per Govt norms. ( Rs. 1,30,835 )
· Organizational structure involved to manage the emergency	-
· Nature of support from the state and Central authorities.	Funds released by State Govt. under the head Natural calamities.

## EARTHQUAKES

· Type of Episode	Koyana Earthquake
· Location.	Koyananagar ,Tal .Patan.
· Date	11th Dec,1967
· Reasons assigned for the events	-
· Warning system used.	Wireless message
· Community response to warning system.	Good
· Administrative response to warning system.	Good
· Assessment of Administrative preparedness.	Good
· Area affected (number of villages)	Entire district and Maharashtra.
· Extent of damage	1904 lakhs for the properties and Koyana Dam.
· Number of lives lost	161 persons
· Crop damage	-
· Damage to houses	88,000 houses.
· Loss of Cattle	
· Damage to infrastructure (specify infrastructure)	N.A
· Procedures followed for assessing of various types of damages the compensation norms used.	For assessing damages the officers in the rank of Tahsildars were appointed for For assessing damages in each revenue circles. . Special post of Adl.Collector was created to look after the rehabilitation work in the district.
Break-up of expenditure incurred on relief and rehabilitation.	Revenue dept has spent an expenditure Of Rs. 988 lakhs on rehabilitation,and Irrigation dept. has spent Rs.916 lakhs for strenghting the Koyana Dam.
Organizational structure envolved to manage the emergency	NGOs and foregein countries have donated to meet the emergency.

## CHEMICAL ACCIDENTS

· Type of Episode	Giletin Blast
· Location.	Sangumnagar (Khed) Tal.Satara.
· Date	13-3-1997
· Reasons assigned for the events	Unknown.
· Warning system used	-
· Community response to warning system.	Good
· Administrative response to warning system	Good

· Assessment of Administrative preparedness.	-
· Area affected (number of villages)	1 .k .m.
· Extent of damage	Rs.19,33,300(to houses) . Rs. 15,76,100( on vehicles).
· Number of lives lost	18 persons died,45 injured.
· Crop damage	crops from 2.58 hectar area is damaged .Total crop damage comes rto R s.50,250 .
· Damage to houses	195 houses
· Loss of Cattle	12 sheeps
· Damage to infrastructure (specify infrastructure)	-
· Procedures followed for assessing of various types of damages the compensation norms used.	The panchanams were made through Revenue machinery of houses and crops damages and the vehicles damage by the R.T.O etc .Compensation given as per recent Govt orders.
Department wise break up of the expenditure incurred on relief and rehabilitation.	

Name of Dept.	Type of relief/compensation and rehabilitation	Expenditure
Health Department	Medical services to injured persons	-
Rev Dept	Relief and compensation paid to the sufferers and next of kins.	

The Revenue, Police and Health Depts have played key roll in bringing the situation normal in that area ,where the Giletin blast took place.

## **FIRE**

· Type of Episode	Petrol Tank blast in road Accident.
· Location.	Near Kawathe on Natiional Highway Tal. Wai.
· Date	30-10-1987.
· Reasons assigned for the events	Accident to Petrol tank on a Track unexpected incidence.
· Warning system used	-
· Community response to waming system.	-
· Administrative response to waming system.	-
· Assessment of Administrative preparedness.	-
· Area affected (number of villages)	Accident spot on road (Highway)



VII . Consequences of major hazards -  
from storage for each chemical.

Consequences of major hazards from processing All the systems is closed and no contact with atmosphere.

IX. Physical range of consequences Nil

X .An inventory of personal protective equipment in the factory premises I)Dry chemical powder  
ii) DCP extinguisher  
iii) Carban Dioxide .

XI Action required :

1) Fire Brigade :- Nearest Fire brigade - Satara, Telephone No. 02162-21388.  
i) Fight Fire  
ii) Keep alcohol storage cool  
iii) Spray water immediately  
iv) Remove trapped persons.

2) Police Service :- Nearest Police Station - Bhuj, Telephone No. 85233  
i) Cordonning off the area  
ii) Evacuation of the nearby residents if advised.  
iii) Vigilance on affected plants to keep them undisturbed till completion of enquires.

3) Medical Services :-

i) Ambulance available on Karkhana site. No. MH-11  
A-2600

ii) Available at Gramin Ruganalaya, Wai, Phone No. 70144

iii) Available at Mishan Hospital Wai, Phone No. 70004

iv) The Plant has dispensary to serve first Aid during emergency with a part time Medical Officer.

4) Communication Services :-

Broadcast to community - Shri. S. S. Jagatap,  
Phone No. - 02167- 85240, 85243.  
Internal - 223

(xii) Estimated Response Time :- Immediately response from all the services is necessary.

Layouts of the Plants :- Enclosed

## Fact Sheet 2

I .Factory identity Krishna Sahakari Sakar Karkhana Ltd.

Rethare Bk. [post office)

II Address

Shivnagar Tal.Karad,Dist. Satara.

III. Location( mention the industrial estate if applicable) Shivnagar, Rethare Bk.

IV. Contact person Shri .D. S. Shinde Mananging Director

V. Principle activity(ies) for each plant Manufacturing of White sugar ,Alcohol Country liquir ,MFL & Acitone

VI. Inventory of the hazardous chemicals( raw material, intermediate products, final products and wastes)

Name of the chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system.
Molasses	19500 MT	Storage Tanks	250 MT
Sulphur	550 M.T	-	-
Ethyl Alcohol	3300 M.T.	---do---	70 to 75 M.T. max
Acetone	900	25 tons	15 MT per day
Caustic soda	35	in cans	35

VII Consequences of the major hazards from storage for each chemical Alcohol & Acitone fire hazard affecting above ¼ K.M in radius

VIII. Consequences of major hazards from processing. Nil

IX. Physical range of consequences. Maximum 1 K.M. in radius.

#### Storage

The area of influence(sq.km) as well as the names the villages within that area for each chemical should be clearly indicated. 1/4 k.m.

#### Manufacturing

The area of influence (sq.Km) as well as the names of the vi llages within that area for each chemical should be clearly indicated.Limited to distillery premises..

X. An inventory of personal protective equipment in the factory premises. 1) Own fire-brigade 2) Factory Ambulance

#### (xi) Action Required :-

i) Fire Brigade :- Safety Officer and Security Officer of krishna SSK Ltd. Phone No.- 02164-66222 to 66225 Ext. 234 & 232, 222.

a) Fire Brigade :- Karad 02164-2444

b) Fire Brigade :- Islampur 0342- 129

c) Sahyadri Ssk Ltd. Yeshwantrager :- 02164-71471

ii) Police Service :- a) Shivnagar police station, Shivnagar.  
Tal. Karad, Dist. Satara.  
Phone 02164-66222 Etn. 333, Shivnagar.

b) Police Sub-Inspector, Karad  
Phone 02164-2233.

iii) Medical Services :- a) Krishna Karkhana Hospital :  
Ph. No.- 02164-66222, Etn. 333 & 248 (Hosp.) 348 (Res.)  
For medical facilities , medical equipments antidotes, No. of beds etc.

b) Cottage Hospital - Karad - 02164-2459.

c) Krishana Hospital - Karad - 02164-81666.

iv) Services :- a) Distillery Incharge. - Shri R.T. Bhosale, Communication  
Ph.No.-02164-66222 to 66225 Ext.-260(O.),360(R.)

b) Acetone Incharge - Shri R.S. Doshi,  
Ph.No.-02164-66222 to 66225 Ext.-221(O.),321(R.)

c) Safety Officer - Shri B. R. Pawar,Ext. 234 (O.), 222 (Maingate).  
Action required to be taken by the -

1) Central South Shenoli Station Railway Station within 15 minutes from our factory.

2) Air Port - At Karad.Within 30 minutes from our factory.

3) Bus Services - from our factory to karad bus available with regularity 1 hour.

**xii) Estimated response Time :-**

Immediate response from all the service is necessary as under :

i) Emergency action within 15 minutes of occurrence :

a) Stop affected plant.

b) Rush affected person to Medical Officer in our factory hospital.

c) Switch off Electrical supply.

d) Start the fighting of fire with available equipments.

e) Isolate the affected plant from storage or storage tank from process plant.

f) Keep the alcohol or acetone storage cool by sprinkling.

- g) Give emergency alarm to the workers colony residents and village.
- h) Try to obtain mutual aid from factories and residents nearest fire brigade stations.
- ii) Emergency facilities/action required as :
  - a) Emergency use of portable dry chemical powder and CO2 fire extinguishers.
  - b) In our factory trained manpower.
  - c) Om Ganesh make fire fighter with hoses and nozzles.
  - d) kirloskar make 50 HP petrol fire fighter pump with hoses and nozzles.
  - e) Use of personal protective equipments.

**xiii) Layouts of the plant (to be updated as and when expansion / modernisatin.**

**Fact Sheet on the Industry(III)**

Information on major hazardous industries may be collected for each hazardous industry as per the format given below.

I. Factory Identity	Sahyadri Sahakar Sakhar Karkhana Ltd Yeshwant
II Address	Tal. Karad .Dist. Satara.
III Location(mention the industrial estate if	Yeshwant nagar.
IV. Contact persons	a) Shri G S Chawan M D
V .Principle activities(ies) for each plant.	Manufacture of Alcohol
VI Inventory of the hazardous chemicals/raw	

---



---

### Storage

The area of influence (sq.Kms) as well as the names of the villages within that area for each chemical should be clearly indicated

X. An inventory of personal protective equipment in the factory premises.

### Manufacturing

The area of influence (sq.Kms) as well as the names of the villages within that area for each chemical should be clearly indicated.

I) Fire estinguishers

The List of personal protective equipments and fire fighting equipments and its quantity is as follows :-

Sr.No.	Description of equipment	Quantity in Nos.
1	Chemical Safety Masks	48 Nos.
2	Close cup type Safety Goggles	18 Nos.
3	Gum boots	20 Nos.
4	Rubber Hand gloves	12 Pairs
5	Safety belts	6 Nos.
6	Dry chemical powder extinguishers	68 Nos.
7	Foam type fire extinguishers	21 Nos.
8	Fire buckets	20 Nos.
9	Soda Acid type fire extinguishers	35 Nos.
10.	CO2 type fire extinguishers	14 Nos.

xi) Action Required :-

I) Fire Brigade - The action required to be taken by the fire brigade mainly includes the fighting of fire with suitable extinguish media and control the spread of fire in neighbouring areas. Telephone No. of Karad Municipal fire brigade -02164-2444.

ii) Police Service - To make necessary arrangements for evacuation of plant and neighbouring personal at safest place and restrict the people gathering near injured personnel for shifting to the nearest hospital.

Telephone No. of Police Station	Police Inspector Masur	Karad	-	2377
Police Sub-Inspector	Umbraj		-	52033

Police Sub-Inspector Umbraj - 64033  
STD Code - Karad -02164 .

iii) Medical Services -Establish a medical centre in the nearby area for providing first-aid facilities and treatment to the accident victims. This centre should contain medical, surgical and resuscitation equipment and necessary drugs, dressings, antidotes etc. In addition to this, the medical practitioners in and around the complex could be called upon for necessary assistance and help during the emergency situation if necessary. Names and Telephone Nos. of contact persons are as follows.

1. Dr. A.G. Gujar (M.S.) - 02164-2868

2. Dr. V.R. Gharge (M.D.)- 02162-33617

3. Dr. K.P. Lokhande (B.H.M.S.)- }02164-71171,71271,71371.

4. Dr. Mrs. J.D. Bagwan ( -do- ) } Extn. 333

5. Dr. Mrs. D.D. Kulkarni ( -do- ) }

III - 3

iv) Communication Services :- Identify the communication need that would exist in the event of a disaster and to provide secondary communication system for use in the event if the primary system is inoperative. To establish contact with nearby organisations and other offices and ascertain the communication facilities working well. I.e. Telephone, Personnel Messengers, DC batteries Diesel generator sets, broadcast etc. if necessary.

xii) Estimated Response Time - Within 5 to 10 minutes.

xiii) Layout of the plant is enclosed herewith.

#### Fact Sheet on the Industry (IV)

Information on major hazardous industries may be collected for each hazardous industry as per the format given below.

I. Factory identity : Shriram Sahakari Sakhar Karkhana Ltd. Phaltan, Nira. +

II. Address : Valley ArkshalaVibhag, Phaltan . Dist. Satara.

III. Location (mention the Nira Valley Vibhag Phaltan.

industrial estate if applicable :

IV. Contact Persons : I) shri. S. K. Patil , M.D.

II) shri A.S. Patil, Dist. Manager.

V. Principle activity(ies) for each Molasses pumping, Distillation of Molasses , Plant : Fermentation of Molasses etc.

VI. Inventory of the hazardous chemicals (raw materials, intermediate products, final products and wastes)

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system
Ethyl Alcohol	-	1297.6 M.T.	
Neltrat spirit	-	95.2 M.T.	3.6 M.T.
H.B. so4	-	0.08M.T.	-
Bleaching Power	-	0.50M.T.	-

VII. Consequences of major hazards Storage Section is close one. The operating from storage for each chemical electrical appliances are flame proof.

VIII. Consequences of major hazards Proper ventilation is provided to escape co.2 from processing gas from the Fermentation section.

IX. Physical range of consequences ----

#### Storage

The area of influence (sq.Kms)as well as the names of the villages within that area for each chemical should be clearly indicated

#### Manufacturing

The area of influence(sq.Kms) as well as the names of the villages within that area for each chemical should be clearly indicated.

X. An inventory of personal protective  
I) Dry Power extinguisher equipment in the factory premises.

II) Foam fire Engine & Co.2 extinguisher

III) Co.2 Fire extinguisher.

#### Fact sheet on the Industry (v)

Information on major hazardous industries may be collected for each hazardous industry as per the format given below:-

I. Factory identity Ajinkyatara Sahakari Sakhar Karkhana Ltd.Shahunagar, Shendre ,Tal. Satara

II. Address Shendre.Tal.Satara,Dist.Satara.

III. Location(Mention the industrial Shahunagar.

Estate if applicable.

IV Contact person Shri. .V. H. Aparadh Managing Director, Shri.A .N.Gavhane,Distillary Incharge

V Principle activity(ies) for each Molasses pumping,Dilution of Molasses,plant Farmentation of Molasses.

VI. Inventory of the hazardous chemicals (raw materials ,,intermediate products,final products and waste)

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemicals in the processing system.
Ethyl Alcohol	-	800M.T.	28 M.T.
Neutral Spirit	-	480 M.T	4 M.T.

VII. Consequences of major hazards It is open atmosphere. Alcohol vapour from storage for each chemical. condensers are provided with water circulation to each tank.

VIII .Consequences of major hazards More care has been taken.

From processing.

IX .Physical range of consequences. Nil

### **Storage**

The area of influence (sq.Kms)as well as the names of the villages within that area for each chemical should be clearly indicated

### **Manufacturing**

The area of influence(sq.Kms) as well as the names of the villages within that area for each chemical should be clearly indicated.

X.. An inventory of personal protective

1) Soda acid,equipment in the factory premises.

2) 5 extinguisher ,& foam fire extinguisher

3) C.O.2 extinguisher, & C.O.2 fire extinguishers & Dry Chemical powder Ambulance.

An inventory of personal protective equipment in the factory premises :

i) Fire fighter - 1 nos.

ii) Fire Extinguishers -

a) Foam type - 6 nos. of 9 lit cap each.

b) CO2 type - 3 nos. 6.5 kg. each.

c) Dry chemical powder - 5 nos. 10 kg. each.

d) Soda acid type - 5 nos. 9 lit each.

e) Soda acid type - 2 nos. 30 lit each.

x) Action Required :-

i) Fire Brigade - Telephone No.101, Satara.

ii) Police Service - Satara Police Station, Tel.No.23390 21078

iii) Medical Services - Civil Hospital Satara, Tel.No. 20627 Ext. 101 Ambulance. Karkhana is having fulflaged Ambulance.

xi) Estimated Response Time :- Within 30 minutes.

xii) Layout of the Plant :- enclosed

xiii)

a) Occurance of Road accidents and fire in the last 30 years - Nil.

b) No. of death due to Road accidents & Fire - Nil.

c) Total loss due to Fire accidents & Fire - Nil.

xiv)

a) Occurance of Industrial & Chemical accident in the last 30 years. -Nil.

b) No. of deaths due to Industrial & Chemical accident - Nil.

c) Total loss due to Industrial & Chemical accident (Rs.) - Nil.

d) Expenditure incurred on relief and compensation during last thirty years on there opisodas (in Rs.) - Nil.

**New Industrial Estates(undertaken/proposed).**

**(a) Co-operative Industrial Estates.**

Name of the Industrial Estate	(i)Proposed Abhinav Sahakari Audhyogik Vasahat, Vaduj
Location of Industrial Estate	At & Post.Vaduj,Dist.. Satara
Nearest Urban/major rural Centre.	At & post. Vaduj. Dist. Satara

**(b) Co-operative Industrial Estate.**

Name of the Industrial Estate	Proposed Koteshwar Sahakari Audhyogik Vasahat, Raigaon Tal. Jaoli. Dist. Satara
Location of the Industrial Estate	At & post. Raigaon,Tal.Jaoli Dist. Satara
Nearest Urban /major rural centre	At & post .Raigaon, Tal. Jaoli

(VI) Large industries set up or proposed.

4	Tuljabhavani Devi Sahakari Sakhar Karkhana Ltd. Phaltan.	Rajuri,Phaltan,Satara.	Sugar factory
5.	Kisan Veer Sahakari Sakhar Kar khana Ltd.At.& Post.Khandala	Khandala Satara	Sugar Factory
6.	Samarth Ramdas Swami SPG Mills Pvt Ltd. Khindwadi,Satara	Khindwadi,Satara	Cotton, Carded
7.	Maharashtra State Ele. Board	Koyana Satara	Hydro-electricity
8 .	Bharat starch Chemical ltd.	Karad, Satara	Citric Acid Factory
9.	Rayat Sahakari Sakhar Karakhana Maryadit, Kolewadi, Karad,Satara	Kolewadi, Karad, Satara.	Sugar Factory
10.	Pratapgat Sahakari Sakhar karakhana,Ltd.Kudal Tal. Jaoli, Satara	Kelghar,Jaoli,Satara	Sugar Factory