

"PROBLEMS OF FIRE HAZARDS AND THEIR MANAGEMENT IN SOLAPUR DISTRICT"

A Minor Research Project Report Summary

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(Summary)

By

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SUMMARY

PROBLEMS OF FIRE HAZARDS AND THEIR MANAGEMENT IN SOLAPUR DISTRICT

Introduction:

The human life and his property are the most valuable for the society. In the present situation due to growing industrialization and urbanization processes, the living pattern of a man has been changed. Natural calamities, social wars, accidents etc. destroy the human life and his property in a very short time. The natural resources are also lost during such incidences. Many a times these incidences are unpredictable. They are difficult to control even though the human resources are available for the control.

Among these calamities 'Fire' is the most dangerous component to destroy the life and property. 'Fire' is considered as the first invention of man. Water, sun, wind, soil are the natural gifts to man.

The minute observations and skills of man are responsible for number of discoveries and inventions. They are being used for his betterment. However, after the industrial revolution, the problem of fire hazards has become more serious. The industrial towns, urban, settlements, with sky scrapers, narrow roads and lanes, compact settlement, no. of vehicles, crowds on the roads make the problem of fire more severe. Shortage of water, careless handling of inflammable materials, absence of fire controlling equipments and abundant supply of inflammable materials in rural areas are helping to increase number of incidences as well as the loss. The accidental fires due to leakages, seepages should be controlled immediately.

The rate of urbanization has been increased after independence in India. Presently due to industrialization and urbanization 32% of total population is concentrated in urban areas of India. As the urban growth is

taking place, fire incidences are also increasing. Maharashtra is one of the most industrialized and urbanized states in India, where 43% of urban population is present.

Within the state of Maharashtra, Solapur district occupies about 4.2% of area and 4.5% of population. The district has some industrial establishments in the towns. However, most of the area is occupied by small towns and villages. There are three National Highways six State Highways and two Broad-gauge Railway lines of the Central Railway running across the district. An International Airport is under construction near the district headquarters, Solapur city.

A fire can be controlled, before it catches. Considering the present population and areal expansion of the district, the existing fire stations are not enough in number. They are scattered in the district and concentrated at mostly the towns and cities only. Some private industries like sugar factories do have their fire brigades. It is not possible for these fire brigades to attend a call as early as possible to control the fire hazards in the entire district.

As per 2011 census, nearly 67% population of the district is in rural areas where fire prevention services are nearly absent. All of the small towns in the district mostly do not have fire services. The result is poor people have to just stand and watch helplessly the 'fire' that is destroying everything in a short time.

Relevance of the Topic:

The problem of fire hazards and their management is a multidisciplinary subject Social sciences, technology, pure and applied sciences are related directly or indirectly with the topic. Geography as an applied subject can consider the various dimensions of this problem together. A geographer can justify such as wide spread problem separately.

Welfare of the society is a prime aim of any study. There is no doubt that urban areas face frequent incidences of fire. Such incidences have to be controlled as early as possible to minimize the loss. The rural areas also have the problem of fire hazards. The thatched roofs, storage of hay and dry fodder on open grounds, storage of fire wood make the areas, valuable to fire shortage of water absence of fire detecting services, as well as fire extinguishers and the accessibility are responsible to increase the loss.

Objectives:

- 1) To trace the present frame and structure of fire brigades within Solapur district.
- 2) To study the history of development of fire services within the district.
- 3) To list out the short comings of fire services.
- 4) To suggest the new locations for extended municipal areas.
- 5) To suggest remedies for the problems of human resources regarding fire services.
- 6) To develop human resources which can be utilized in any calamity as supplementary force.

Methodology:

1) **Literature review:** Various information has been collected from internet wekipe dia-free encyclopedia. It includes :

- i. SFAC guide lines for the government and structure of fire brigades in the country.
- ii. International scenario of fire brigade services in various countries.
- iii. Guidelines provided by the Chief Fire Advisor, Human Resources Development, Ministry, Government of India. It also includes analysis of some major fire incidences and their reports.

- iv. Guidelines for control of fire in forested areas.
- v. www.maharashtrafireservices.org.

2) Data Collection:

- i. The data regarding area, population characteristic, transports and communication have been collected from the Gazetteer of Solapur district, 1972, Socio-economic review of Solapur district 1991, 2001 2005, 2007, published by Government of Maharashtra.
- ii. Recent population data has been collected from Census of India 2011 (Internet- Google search - Census India - 2011)
- iii. The data of fire incidences has been collected from the Police Record for Solapur district. It is published in the local daily news papers also.
- iv. Sample survey of the villages and industries has been carried out to find out the availability of fire services.
- v. The available data has been tabulized and processed for further analysis. Nearest Neighbor Technique, Karl Pearson Test of product movements have been used to find out the correlations between the number of incidences, available fire service stations and material loss. Nearest Neighbour Technique was used to find out mean distance between the settlements.
- vi. The collected data has been interpreted to find out the main causes of fire hazards the available services, problems faced by the services as well as the suggestions to solve the problems.

Introduction:

Fire hazards is a multidisciplinary subject. It includes pure sciences, social sciences as well as applied sciences. Wherever a 'fire hazard' takes place, material loss takes place. It may include the life loss also.

Presently, due to increasing population and industrialization, the natural resources like forests, coal, natural gas, crude oil are being used at a rapid rate. Their deposits are decreasing at an alarming rate. We have to conserve these natural resources from hazards like fire.

As a geographer, this problem can be better understood due to multidisciplinary nature of the subject.

It has been noted that every year in all parts of the world, fire hazards are responsible to loss trillions of rupees and also precious life of all living beings. Solapur district also experiences such problems. Therefore, it was decided to select the topic of fire hazards for this minor research project.

Chapter II represents the review of literature. The Standing Fire Advisory Council (SFAC) under the Ministry of Home Affairs provides guidelines in India about fire services to save life and property. It also provides norms for establishment of fire services in India.

- 1) According to this council, a fire service station should respond to a call in three to five minutes at A, B and C zones and for 'D' zone it is 20 minutes.
- 2) There should be a fire station at 10 km² distance, which is flexible.
- 3) As population is considered, there should be one fire station for each 50000 population in urban areas upto 3 lakh population. Beyond that, one additional station should be present for each one lakh of population. The arrangement of turn table ladders, rescue vans, ambulances is also required in the towns and cities.

According to law, each town and city should have provision for fire stations. However, the experts in the field like G.B. Menon, Chief Fire Advisor (retd.) Government of India, State that less than 6th of required strength of the fire services are present in India. The rural areas are having worse conditions than the urban centres. It is not advisable that the

urban centres do provide services to near by villages. There is a need for National Fire Service Commission. In absence of proper safety norms the fire incidences also increase. The Delhi Chief Fire Officer states that there are more than 700 buildings in Delhi which have violated the standard norms.

Mohit Iasija has discussed in details the causes of fire hazards and forest fires. According to him most of the forest fire hazards are due to human responses.

A study based on efficiency of fire services in Pune city by Anand Akmanchi and all states that the response time is 11 minutes in Pune, which should be 3 to 5 minutes as per the international standards. This problem can be solved by providing additional fire station in the area.

The Schemes of fire services in various countries has been studied to understand how this problem is managed by different countries like Australia, Austria, Brazil, Canada, Chile, Denmark, France, Germany, USA, Hungary, Japan, Netherland, Portugal, Slovenai, UK etc.

Most of these countries have professional as well as private fire fighters who provide the services to any call. There are part timers and volunteers who are trained personals. The laws are very strict in Denmark. The response time is only five minutes after a call. Each call must be attended. Countries like Germany, Japan, Slovenia, have more than one lakh volunteers, other than the professionals and part timers. Japan has 9,20,000 volunteers, while in USA there are 11,16,300 volunteers and France has 1,90,000 volunteers. They are paid for extra work.

New Zealand is specialized in forest fires. A smallest village in Austria also has a fire station which relies on volunteers. Netherlands has a single national digital network communication for any hazard.

In India, there are only 60,730 professionals, which are not at all sufficient for the present population of 120 kres.

The third chapter provides the necessary background to understand the problem of fire hazards in Solapur district. It represents the location of the district. It is located on the Deccan Plateau Indian subcontinent, away from both the coastlines of India. It is a part of the Bhima basin, a major tributary of the Krishna river system. Geologically this is a part of the Deccan plateau formed due to fissure type volcano deposits of lava during Mesozoic period. There are horizontal layers of lava which present as the basalt formations. These rocks are impervious with low water holding capacity. The district is demarcated by the Shambhu Mahadev range in the west and the Balaghat range in the east. This region has an average height 480 m. above the m.s.l. The height of both the ranges is 600 m. and above. The highest peak is 1050 m. in the Shambhu Mahadev range.

Physiographically, the district has 70% part as plateau area, 20% as plains while the remaining are the hills and ranges.

[River Bhima, the main river in the district flows from north-west south-east. It has R. Nira as right Bank tributary, and R. Seena as left bank tributary. Both of these rivers are non perennial. Apart from these, there are number of nalas & odhas which drain to these main three rivers.

3] *Climatic* - As stated earlier, this region has a location away from the coast lines. It is a part of the rain shadow region with hot and dry climate. The annual average rainfall for the district is 583.3mm, decreasing to the west. The climate is hot and dry in the summer while hot and humid during the Monsoon wind period, i.e. June to Sept. Most of the rainfall is concentrated during this period only. However, there are some early summer or early winter showers due to local depressions and cyclones developed over the Bay of Bengal and the Arabian Sea.

The average maximum summer temperatures are 39.9°C while the average minimum winter temperatures are 14.8°C . Thus the winters are warm and dry. The region has strong winds, with average speed 10.3 km/hr . The speed is high due to absences of mountain systems as well as the forest cover also. These winds are responsible for high rate of evaporation. They help to reduce the humidity of atmosphere.

The region frequently experiences droughts. There are number of dry spells during the monsoonal period. It is important as it causes drying of the natural vegetation as well as the standing crops.

4] **soils** - The district has fertile soils. Along the banks of the major rivers thick, alluvial soils are present. Away from these soils there are light black or dark brown soils which have slightly low fertility. Apart from fertility, the moisture retentively of these soils is high. At the foothills of the Balaghat and Shambhu Mahadeo ranges, light brown slightly alkaline, less fertile soils are present.

If irrigation facilities are developed these soil would be very important for the production of food crops like wheat, Jowar, Bajra, pulses, oil seeds and sugar cane also. Cotton and groundnut are the other two important cashcrops cultivated in the region.

Biodiversity -
5) **N. Vege** - Natural vegetation of the region comprises mainly of thorny forest dry deciduous forests and varieties of grasses and climbers. Each tahasil of the district has a small cover of natural vege., which is precocious. The district has only 2.4% area under forest.

A large number of grazing animals like black bucks, chinkara and Indian gazelles are present here along with wild pigs. Their number is controlled by Jackals, foxes, hyena and wild cats. There are some varieties of reptiles also. Panthers are seen rarely.

Painted storks, spoon bills, open bills, flamingo are the some of the important migratory birds visiting the district along with varieties of

ducks. The permanent dwellers are Green bee eaters, Parakeets, Swift's lapwings, pond herons, Kingfishers etc. Among these, great Indian Bustard is an important variety which is an endangered species in India. A protected forest for these birds is present near the district headquarters.

6) Agri - In Solapur district, agriculture is an important economic activity. There is 65.6% of the net sown area under various crops. Though the region is experiencing low rainfall, with the help of irrigation facilities, agricultural production is increasing. Irrigated and non irrigated dry farming techniques are used. Wheat, Jowar, Sugar cane, Pulses, Oil seeds and other food crops are cultivated in all parts of the district. Sugar factories, dalmills, oil mills are some of the important agro based industries in the district.

7) Transport & Communications - In case of transport and communication system of the district, there are national highways, state highways, broadgauge rail-way lines running across the district. The total length of the roads is 14108 km. where 361 km length of the roads comprises national and state highways. The broad-gauge railway line comprises of 452.6 running North South and East West directions Solapur centre. Recently the old narrow gauge 126.9 km railway line is converted into broad-gauge. The air transport is under development stage. An international air port is being developed near from Solapur inspite of the old airport.

However, Mangalwedha, Malshiras, Sangola and Madha tahasils have a poor development of roads. Less than 50% of their respective population is served by the existing roads. N. Solapur and Pandharpur tahasils are having more than 80% population served by the present roads.

The communication systems are available in the district as post offices, telephones, mobiles, radio, television as well as computer internets. However, on an average only 45.77 villages get the facility of

post offices. Highest post offices are in N. Solapur and minimum in Akkalkot tahasils.

Though mobile, internet facilities are available in the district the interrupted supply of electricity, compulsory load shedding and range of mobile towers are the major hindrances in the communication systems. The villages are having 8 to 10 hours of compulsory load shedding except the monsoon period, while in the urban sector, it is 4 to 6 hours. It may increase in summer up to 12 and 8 hours respectively.

8) Settlements There are 1150 settlements in the district scattered over an area of 14895 km² including 10 urban centers. The average density of settlements is 7.67 per 100 km². The settlements have mostly selected water points as there is scarcity of drinking water. Nearly 68% of population is habitated in rural areas while 32% in urban areas.

Solapur district has a variety of industries concentrated at the tahsil headquarters mainly. There are MIDC areas. In addition, there are nine cooperative industrial estates. Apart from sugar factories, dairy farms, chemical unit, engi. units, LPG gas filling plant, etc. & electronic units, spinning mills, textile units are located in these estates. The newly under construction project of NTPC is attracting number of industries in the vicinity of Solapur city.

Solapur is a major market centre since British periods. There are market centres at tahasil headquarters & urban settlements. Apart from these, there are weekly markets. Large number of villages are served by village weekly markets.

9) Sample survey - The fourth Chapter exhibits the sample survey and case studies. The necessary data has been collected from various sources. The primary data includes the field visits and interviews of the people. It also includes the discussions with the chief fire officer, SMC. The secondary data includes the record of fire incidences from police diary, daily published in

This available data has been tabulated, analysed to find out density of population, density of settlements and nearest neighbors.

The collected information regarding the number of fire incidences, material loss, deaths etc. was analysed by using Karl Person Technique of Product movement to find out the correlations.

Ten percent villages from each tahasil were selected and visited to collect first hand information about the facilities of fire protection. The observations and suggestions of local people were noted down to find out the problem and its solutions.

It is noted during the visits that there is hardly any availability of fire fighting services in the rural areas specially which are away from the tahasil headquarter. They are totally dependent on the tahasil fire fighting units. Some of the tahasils like south Solapur, Akkalkot do not have any such service available. They are dependent on the district headquarters. Some of the sugar factories in Malshiras, Pandharpur, Mohol & Karmala tahasils have their fire brigades which provide their services with nominal charges. The tahasil headquarters Karmala, Sangola, Mangalwedha have recently purchased a fire engine in June ²⁰¹¹ 11. For the municipal councils before that, there was no facility available in case of fire hazard.

The villages are scattered, away from each other. Though most of them are located along the streams, there is hardly any water during summer. Large number of villages have the basic problem of drinking

water, which is supplied by tankers, during the summer. In such a situation, a fire hazard becomes a serious problem. Apart from that, considering the road conditions and available communication systems, the available fire brigade does not reach to its destination within the prescribed time of 3 to 5 minutes. If the brigade reaches after 10 minutes, hardly any thing is left to be saved.

A map was prepared to locate the present fire brigades in the district. The command area of each brigade is marked by a circle, considering the prescribed time. This map clearly indicates that a large area of the district does not have any facility to protect the material and life in case of a fire hazard. Even if a small hut is lost, it is the precious lifetime achievement of the poor family.

The district has only 2.4% forest cover which is very much important. A protected forest for the great Indian Bustard is located near Solapur city. This small forest cover experiences forest fire frequently during early summer. The dry grass and shrubs catch fire very easily. Acres of forest is lost in short time. During the study period 65 to 70 Hectors of forest was lost due to forest fire.

Analysis of the Data -

The causes of the fire hazards and the loss in rupees was noted during the period. Kerosene stove and Kerosene are the two most important reasons of death, careless handling is responsible for this loss. Electric short circuits are responsible for loss of standing crops like sugarcane as well as number of shops in the urban areas. Uncertain supply of electricity caused accidental deaths. The careless use of fire wood, unattended chalthas also cause loss of household property in rural areas. The lighting associated with stormy winds cause loss of live stock in the open fields. Leakage of LPG gas caused accidental deaths and loss of household material in the cities mainly. Bright sunshine is a cause of fire of bagass in sugar factories specially in summer. Unknown reasons,

explosion of boiler, electric shock while working are some of the other important reasons of fire.

The fifth chapter include the conclusions & suggestions.

Conclusion

1. The present density a population in the district is 290 km². It is high in the 10 urban centers.
2. Most of the rivers are dry during the summer.
3. Scarcity a rainfall cause problem of drinking water in Villages. There is no available water in villages for the fire fighters in case of a hazard.
4. Most of the villages are connected by poorly developed roads or cart tracks. Even the tar roads have poor conditions.
5. Govt. of India has laws for the municipal authorities to provide fire fighting facilities within their administrative limits. However, presently only six urban centers have their own fire brigades. Three centers are recently developed. The other 4 cities do not have any fire brigade. The three tahasils Malshiras, Mohol, South Solapur do not have any urban settlement. The tahasil headquarter is a large village.
6. The sugar factories in Malshiras, Pandharpur, Karmala, Mohol have their own fire brigades which provide the services to outsiders if asked for with some charges. Ali of the factories or MIDC areas, industrial cooperative units do not have any such facility to handle a major incidence.
7. Not only the absence of fire fighting equipments but there are very few workers who can handle fire carefully. There is no special training provided to all workless in the factories and mills.

8. Excluding Solapur city, only five engines are available to the entire district as a facility provided by the government.
9. In general, people are unaware of the fact that there can be a fire any time, any where. Very few people are able to tackle the situation. The basic knowledge of fire fighting is also not known to all.
10. The SFAC has provided guidelines for fire protection systems. But, these guidelines are not applied in every situation.
11. Some of the villages are more than 50 km. away from their tahasil headquarters, however the neighbouring district headquarter is very close to the village. In such a case also the villages cannot get help from the neighbors, they have to call their tahasil or district only.
12. After studding the arrangement of fire services in various countries it is concluded that there should be more programmes for volunteer developments as well as professionals.

Suggestion –

- 1) It should be mendatory for each urban centre to develop its own fire service station according to the guidelines of SFAC.
- 2) The volunteers are developed though NSS and NCC. Their number is limited. India should have a large number of volunteers considering the size of population and total area. These trained persons could be used in case of any emergency.
- 3) Primary knowledge of fire fighting is a must for each and every industrial worker. Their knowledge has to be updated time to time.
- 4) Civil Defense services are available only in certain cities like Mumbai, Pune. Such services should be developed in every district headquarter along with the home guards.

- 5) Present cost of a fire engine is considerably high; unaffordable to smaller towns and villages, New fire engines should be developed of smaller size for such towns & villages.
- 6) On the basis of Block development authorities, there should be a group of villages based on population and distance. A fire engine should be present at central place.
- 7) The youth clubs, active social workers and social groups, should be trained as volunteers. Japan has 9,20,000 volunteers apart from the professional.
- 8) Many countries like USA, Canada have part timers as fire fighters. They are paid for these additional duties.
- 9) China has undertaken special programme for rural fire protection. It is planning for fire safe environment, fire safe buildings and infrastructure.
- 10) India must protect the rural population also from fire hazards. There increasing literacy rate may help to develop skills and awareness among the farmers about the fire hazards.
A fire can be controlled before it catches a fire.

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