

# Asian Resonance

## Fire Hazard and Fire Services in District Bathinda (Punjab, India)



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### Abstract

A fire hazard is situation where there is greater than normal risk of harm to property or people due to fire. Fire is a very good servant, but a very bad master. As long as fire is under control, it serves a lot of useful purposes but once it goes out of control, it can create a lot of destruction. **Aim:** The objective of the present research paper is to document the fire hazards and fire services in district Bathinda (Punjab). **Study Area:** District Bathinda is located in the southern part of Punjab state and it shares its boundaries with Faridkot in the north, Muktsar in the west, Barnala and Mansa in the east and state boundary with Haryana in the south. District Bathinda is selected for the study because of its vulnerability to various types of fire hazards viz. crop fire, electrical fire, domestic fire and industrial fire. **Methods:** Data was obtained from both primary as well as secondary sources. The primary data was collected through observation method and through informal interviews with the concerned authorities, officials and local people. Secondary data was obtained from District Disaster Management Authority. **Findings:** District Bathinda is an industrial hub of Punjab state. No doubt these industries have their own well equipped fire stations but if any major fire breaks out at any of these sites; it can result in massive destruction. So the district administration should be fully prepared to deal with any kind of emergency situation. The problem of shortage of staff and state-of-art equipments must be fulfilled by the administration.

**Keywords:** Fire hazard, Fire services, Fire Management Cycle

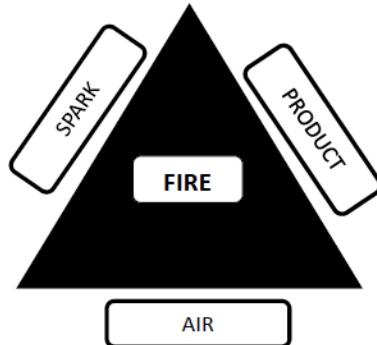
### Introduction

Fire is one of the most severe hazards to which built-infrastructure may be subjected during their lifetime. Fire hazard can be defined as a hazardous area where fire can start or where smokes or gases can be generated, or where an explosion can occur endangering the lives of people. Fire under control serves many useful functions, but once it goes out of control, it can result in intense loss of human life, infrastructure and environment. However, despite the presence of fire services and safety measures, the occurrence of accidents is often inevitable. Figure 1 clearly explains the process of fire. Fire takes place when the three components are present- spark, product and air; and to extinguish the fire one has to cut-off one of these three components from the fire. The most common causes of major fire incidents are damaged wiring, damaged plugs, damp or wet wires, overloaded motors, broken switches, outlets or sockets, problems with lighting fixtures, faulty heating elements, overloaded circuits, smoking around flammable or combustible materials, throwing matches and cigarettes or cigars on tables or workbenches, tossing butts on the floor or grass without properly extinguishing them, tossing lighted butts or matches out windows or doors, smoking in bed and leaving a cigarette/cigar unattended etc. Fire incidents can broadly be divided natural and manmade fires. Fires caused by natural incidents or hazards like earthquake, volcanic eruption and lightning are considered as natural fires. Fires caused by human negligence or system failure are called manmade fires such as industrial or chemical fire, festival fires, accidental fire and domestic fires. Rural and urban residential and non-residential structural fires are also largely manmade fires.

The objective of the present research paper is to document the fire hazards and fire services in district Bathinda (Punjab). District Bathinda (Map 1) of Punjab is selected for the study because of its vulnerability to various types of fire hazards viz. crop fire, electrical fire, domestic fire and industrial fire. Incidents of crop fire, electrical fire and domestic fire are very common in Bathinda city because of the congested building structures. There are also a lot of industries in the district and any explosion in those

industries can prove immensely disastrous for the population living in the vicinity of the industries and environment too.

**Figure 1: Process of Fire**



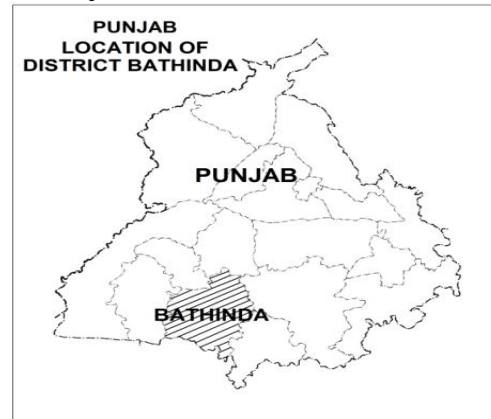
### Methodology

The paper has been written by obtaining data from both primary as well as secondary sources. The primary data was collected through observation method and through informal interviews with the concerned authorities, officials and local people. Secondary data was obtained from District Disaster Management Authority.

### The Study Area

District Bathinda is located in the southern part of Punjab state and it shares its boundaries with Faridkot in the north, Muktsar in the west, Barnala and Mansa in the east and state boundary with Haryana in the south. It covers total area of 3,355 sq km constituting three tehsils, eight towns and two hundred eighty one villages. The district lies in the Indo-Gangetic alluvial plains, remnants of sand dunes can be found. The climate of the district is dry with hot summers having maximum temperature of 47°C, short rainy season (avg 405.6 mm) and cold winters. The total forest cover of the district is 6000 hec (0.15%). According to the Census of India (2011), the total population of Bathinda district is 13,88,859 persons. The density of population of is 414 p/sq km and the literacy rate is 71.6%. District Bathinda is also considered as the education hub having Central University of Punjab, forty eight colleges and more than thousand schools. As much as two third of population is engaged in farming. The main crops are wheat, rice, maize, barley, groundnuts, sugarcane and cotton. Major industries of the district are HMEL Refinery, National Fertilizer Ltd., two thermal plants, Hindustan Petroleum Corporation Ltd., Indian Oil Corporation Ltd., Bharat Petroleum Corporation Ltd. and Vardhman textiles.

**Map 1:  
Punjab: Location of District Bathinda**



### Fire Incidents in District Bathinda

According to HPC Committee report, fire is one of the major causes of accident related disaster such as forest fire, urban fire, festival fire, electrical fire, village fire and district Bathinda is vulnerable to such incidents of fire. The district is highly prone to crop fires in rural areas due to its dry and hot climate conditions. Although crop fires lead to no loss of human lives, yet they result in huge economic losses to the affected farmers. Urban fires are mainly caused due to short-circuiting, low quality wiring, loose electricity wirings etc. There are also a number of cases of domestic fires in the district caused due to LPG cylinder bursts. The conditions making the urban areas of the district more vulnerable are congested markets and high density of population in the city. Even if a single major cause of fire is taken care of, not only would it lead to saving innumerable lives and properties but also cut down on expenditure incurred on fire mitigation.

High population density, crowded streets, poor and unplanned old construction, inadequate water supply, poor electrical services, unplanned setting of fire stations, encroachment are few examples of ineffective planning which adversely affect the fire response time. The developmental activities are in full swing in the sub-urban area, with complete disrespect to environment and fire safety aspects. Fire services have also failed to participate in urban planning process, because they do not possess adequate and reliable data base to project their concern in the planning process. They have also failed in providing an interactive forum for the architects, planners, citizens and the fire professionals to discuss and resolve the issue causing concern to each other.

#### (A.) Occurrence of Incidents

District Bathinda covers an area of total 3367 sq.km. There are three tehsils, seven blocks and 281 villages in district. The occurrence of fires in the district is very frequent. The fire station located at Bathinda city informed that near about 400 complaints of fire are registered every year. Most of these incidents occur within the city because of the short-circuiting and ignorance of fire safety measures. The provisional data released by Census of India (2011),

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shows that density of district Bathinda in the year 2011 is 414 persons per sq. km. One of the most important reasons of occurrence of fire in the district is the high level of industrialization. There are a lot of industries present in the district headquarter, where fire incidents can result in potentially severe disasters. Some of these are situated within the city or nearby the city and some are situated outside the city in the adjoining rural areas.

## (B.) Time Period of Incidents

In the urban areas of the district the cases of fire incidents occur throughout the year as compared to rural areas. Most of the cases of fire occurrence in rural areas are recorded at a particular time period of the year i.e. from April to May, because in this season some farmers burn the wheat straw and stubble in their fields which result in massive fire incidents. Table 1 shows the loss of crops due to fire and the relief provided by government. It has been observed that in recent years, maximum loss was recorded at Talwandi Sabo in 2005-2006 and the relief provided by government from the Central Relief Fund and State Disaster Relief Fund was Rs. 4,42,820. The same area of Talwandi Sabo received a relief of Rs. 4,18,725 in the year 2008-09 as compensation for the crops damaged due to fire. Further, several other areas received compensation for the crops destroyed due to fire.

**Table-1**  
**District Bathinda: Crop Damage due to Fire**

Sr. No.	Year	Name of Village/Block	Type of Crop	Area Damaged (In Acres)	Amount of Relief fund(CRF)/State disaster relief fund(SDRF) (in Rs.)
1.	2001-02	Talwandi-Sabo	Wheat	-	1,84,200
2.	2004-05	Rampura-Phool	Wheat	-	4,500
3.	2005-06	Talwandi-Sabo	Cotton	610	4,42,810
4.	2008-09	Talwandi-Sabo	Wheat	-	4,18,725
5.	2009-10	Gill Kalan	Wheat	47	2,63,125
6.	2010-11	Gobindpura	Wheat	7	23,000
7.	2010-11	Mehraj, Janduke, Phool	Wheat	38	24,188
8.	2010-11	Rampura, Mehma, Narvara	Wheat	23	12,500

Source: District Disaster Management Authority, Bathinda, Punjab (2012)

## (C.) Causes of Fire Incidents

Most of the fire incidents in district Bathinda are caused due to short circuit or blast of LPG cylinders in households. There are several industries present in the district and they also record many fire incidents due to human negligence, blasts, gas leakage etc.

However, most of these industries have their own fire safety plans. Their fire safety officers work in a very efficient manner. These industries have proper installation of fire extinguishers. Adequate training is provided to the workers in these industrial units and from time to time mock drills are conducted within the industrial premises. Therefore, the loss caused by fire incidents in these industries is restricted within the industrial complex because these industries are able to control fires at the earliest with their own fire tenders. In rural areas, as mentioned above, most of the fire incidents are caused due to stubble and straw burnt by farmers, which is an illegal practice.

## Fire Stations in District Bathinda

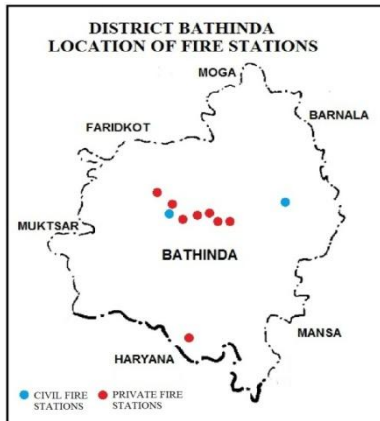
There are two civil fire stations in district Bathinda (Map 2). One is located in the centre of the city and the other one is in tehsil Rampura-Phool. The fire station at Bathinda city comes under the Municipal Corporation of Bathinda city. This fire station is in service since 1945. It has well experienced staff, which is capable of tackling any type of fire. This fire station also offers its services to nearby districts like Faridkot, Ferozpur, Mansa etc. in case of any severe fire incidents.

Apart from these two fire stations located at Bathinda city and Rampura Phool, there are several fire control units present within the premises of big industrial complexes in the district (Map 2). The names of the industries and agencies having their own fire control service are given below:

- National Fertilizers Ltd.
- Guru Nanak Dev Thermal Plant (GNDTP)
- Air Force Station
- Army Area
- HMEL-Mittal Energy Ltd. (Refinery)
- Indian Oil Corporation Ltd. (IOCL)
- Hindustan Petroleum corporation Ltd. (HPCL)
- Bharat Petroleum Corporation Ltd. (BPCL)

These fire stations are also fully equipped with necessary resources for effectively controlling fire incidents. They have their own fire tenders, both water and foam. These stations also have informal mutual tie ups with one another to help each other in case of any emergency. The district administration can also call them up in case of any severe fire incident. These fire stations also have their own proper fire safety plans and fire officers to deal with any type of fire. They also give proper training to their workers to deal with such emergencies and also conduct mock-drills. These industries regularly update their fire safety plans from time to time.

**Map 2:  
District Bathinda: Location of Fire Stations**



**An overview of Bathinda City Fire Station**

The fire station located in Bathinda city is serving from a long time period of near about 70 years. It is situated near Gol Digg, almost in the center of the city. The details of the fire station are as follows:

**(i.) Administrative Structure**

The administrative setup of the fire station located at Bathinda consists of District Fire Service Chief, Divisional Officer, Station Fire Officer, Sub Fire Officer, Driver, Fireman, Telephone Operator and Guard. The information given by the fire station officials revealed that there is shortage of staff at the station. The posts of District Fire Service Chief and Divisional Officer are vacant from a long time. The station is also short of ground level staff like Sub Fire Officer and Firemen.

**(ii.) Resource Inventory**

The list of resources available at Fire Station Bathinda is given below:

- 4 Fire Tenders for Class A Fire (Capacity=5000 litres)
- 2 Fire Tenders For Class B Fire (Capacity=3000 litres)
- 1 Jeep
- 1 Ambulance
- 1 Motorcycle (Foam + Water)

The other equipments available at fire station Bathinda are fire extinguishers, fire suits, gum shoes, foam gallons, portable light and cutter.

**(iii.) Action Team**

When the fire station receives a call about some fire incident, the telephone operator notes down all information about the incident on a complaint slip and immediately rings the central bell of the station. As soon as the bell is rung the staff members of the fire station meet the operator and collect the slip and proceed to the place of incidence within maximum 5 minutes time limit. This system of immediate action is also known as Incident Response System (IRS). The Incident Control Team consists of one fire officer/shift incharge, four fire men and one driver.

**Case Studies of Fire Incidents in District Bathinda**

Two recent case studies of fire incidents that occurred in district Bathinda are given below:

**(i.) Garg Acrylics at Jeewan Singh Wala**

On March 13, 2013 a major fire broke out at the godown of Garg Acrylics at Jeewan Singh Wala near Talwandi Sabo. At 11:00 a.m. the Fire Station at Bathinda received a call about the fire and the fire brigade reached the site within 30 minutes with 6 fire tenders and 17 men crew (2 Sub Fire Officers, 5 Drives and 10 Firemen). The fire tenders from Thermal Plant and HMEL-Refinery (Bathinda) also worked with them to control the fire. After a hard work of near about 50 hours they fully controlled the fire and returned back to the Fire Station at 07:35 p.m. on March 15, 2013.

**(ii.) Kesho Nath Pashupati Nath Petrol Pump Fire**

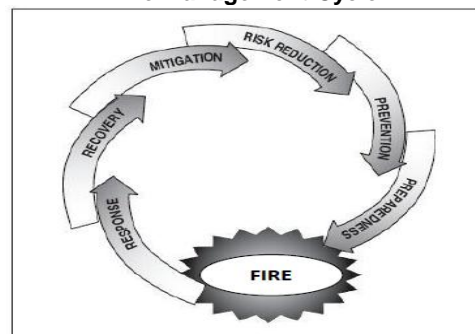
Kesho Nath Pashupati Nath petrol pump is situated near Gol Digg in Bathinda city. The pump is located in a very congested area and any fire or blast incident can become a big disaster for the surrounding area and can be very devastating. A fire broke out at the pump on August 5, 2013 but was immediately controlled by the pump workers by using fire extinguishers. The fire broke out due to a spark emitted by a motor cycle when they were filling their petrol pump containers from the oil tankers. The fire brigade was also called immediately and it reached the site within 2 minutes, but the situation was totally controlled in time by petrol pump workers. The petrol pump manager described the incident in detail and informed that the filling station is fully equipped with 10 fire extinguishers and sand buckets. Moreover all workers of the filling station are properly trained to quickly respond at the time of any emergency. This incident shows the preparedness and quick response of the Bathinda fire station.

**Conclusion and Recommendations**

A fire management cycle must be followed by the officials of fire stations at District Bathinda to overcome fire hazard and minimize the losses caused due to fire. The fire management cycle includes 6 phases i.e.:

- Response
- Recovery
- Mitigation
- Risk Reduction
- Prevention
- Preparedness

**Figure 2  
Fire Management Cycle**



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The first response in the case of fire is to call the fire brigade and the response of fire brigade, police and ambulances are very important to reach the affected place in time with all equipments and experienced staff. After the immediate response, disaster cycle turns toward recovery. During the recovery phase of the disaster cycle, officials are interested in cleanup and rebuilding. Fire recovery includes temporary housing and medical camps are established, utilities are restored and cleaning up of the burnt material from the way. The goal of the mitigation phase in the case of fire is to prevent the fire again. During mitigation fire hydrants and sprinklers are installed in the building to mitigate the hazard from occurring again. Proper laws and bylaws must be made to make these installations worth working. Perhaps buildings are even not rebuilt in extremely hazardous areas. Reducing exposure to fire, lessening vulnerability of people and property, wise management of fire safety plans, and improving preparedness and early warning for adverse events are all examples of risk reduction. These are activities designed to provide permanent protection from fire. Fire sometime cannot be prevented, but the risk of loss of life and injury can be mitigated with good evacuation plans, planning and design standards – for example by removing people and property from a threatened location and by facilitating timely and effective rescue, relief and rehabilitation. Preparedness is the main way of reducing the impact of fire. Community-based preparedness and management should be a high priority.

Community participation is also one of the important tasks at the time of disaster. Community is the first victim of disaster but also the first to respond at the time of disaster. Only a few intelligent and brave persons from the affected community after any disaster can save hundreds of lives by co-ordination, communication and giving somewhat psychological support to others. At the time of fire one of the main roles of community is to call the fire brigade and make use of available resources to control the fire until fire brigade comes and save the lives of the victims.

An examination of fire hazard in district Bathinda shows that the district is very much prone to various types of fires. The fire station located at Bathinda records nearly 400 complaints of fire per annum. Most of the fire incidents in rural areas occur from April to May in the post-harvesting season due to stubble burning. In urban areas the incidents of fire are recorded throughout the year. Most of the incidents in residential and commercial areas occur due to short circuit or blast of LPG cylinder. There are several industries present in the district and they also record many fire incidents due to human negligence, blasts, gas leakage etc. Assessment of fire services available in district Bathinda shows that there are two civil fire stations in the district, located at Bathinda and Rampura Phul. Apart from these, there are several fire control units present within the premises of big industries in the district. These fire stations are also

fully equipped with necessary resources for effectively controlling fire incidents. They have their own fire tenders, both water and foam. These stations also have informal mutual tie ups with one another to help each other in case of any emergency. The district administration can also call them up in case of any severe fire incident. The vacant posts at fire station Bathinda should be filled up at the earliest to overcome the shortage of staff. The state-of-art equipments should be provided to the fire station. Formal tie-ups should be established between the civil and privately owned fire stations in district Bathinda. Mock Drills should be conducted to create awareness among the people.

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