# Fire Protection Services in Karachi

Syed Shahid Ali*

*Department of Geography, University of Karachi, Karachi, Pakistan*

**Abstract:** Public services are the active organs of governments facilitating people to a level of comfort. The provision of these services is an essential part for exercising power by a government. Fire protection is also one of the basic public services which plays a significant role in emergencies. Generally, their service brings a relief helping people to come out of a situation of panic and terror. Karachi is a mega city with a population of more than twenty million and about three million households have only twenty two firefighting station set ups, roughly one station to cater to the needs of one million people. This study is a critical evaluation of effectiveness of these services across the city. Slums and high rise structures in the city pose serious problems in the functioning of these services, besides which encroachments along roads, road conditions, lack of protection from law enforcing agencies, low level of awareness of people regarding fire incidence and finally lack of firefighting attributes and government support are the major problems.

**Keywords:** Firefighting services, city structure, buildings, road network, and people's response.

## INTRODUCTION

A public service is a service which is provided by government to people living within its jurisdiction, either directly (through the public sector) or by financing provision of services. The term is associated with a social consensus (usually expressed through democratic elections) that certain services should be available to all, regardless of income. The availability of these services is fundamental to human rights bringing a sense of protection and ease to the life of individuals and also to the societies. There are four major components of the public sector which are Basic Services, Public Utility, Public Works and Social Services. Basic services include Civil Service, Fire Department, Law Enforcement Agencies, Postal Service, Saving System, Public Broadcasting and Public Transport while Public Utility includes Electricity, Oil and Gas, Telecommunication and Public Water System etc. Public Works Involve Infrastructure, Health Care Units, Educational System and Public Space and Social Services involve Public Housing National and Social Insurances and Pensions.

## FIREFIGHTING SERVICES: A BRIEF HISTORY

Firefighting services both public and private perform emergency firefighting and rescue work within a certain jurisdiction, which is typically a municipality, county, or fire protection district [1]. According to historical records the earliest firefighting services were established in the Roman realm. The Emperor Augustus established a public fire department in 24 BCE, composed of 600 slaves distributed amongst seven fire stations in Rome [2].

In the 17th century after the Great Fire of London in 1666 several fire brigade stations were developed by insurance companies. By realizing that a lot of money could be made from this practice many more companies set up in London in 1832. The city of Boston, Massachusetts, established America's first publicly funded paid fire department in 1679 [3]. Established in 1853, the Cincinnati Fire Department is the oldest paid fully professional municipal fire department in the United States [4].

In the 19th century, the practice of fire brigades refusing to put out fires in buildings that were uninsured led to the demand of central command for fire companies. Cities began to form their own fire departments as a civil service to the public, obliging private fire companies to shut down, many merging their fire stations into the city's fire department. In 1833, London's ten independent brigades all merged to form the London Fire Engine Establishment (LFEE), with James Braidwood as the Chief Officer [5]. Braidwood had previously been the fire chief in Edinburgh, where the world's first municipal fire service was founded in 1824, and he is now regarded, along with Van der Heyden, as one of founders of modern firefighting [6]. The LFEE was then incorporated into the city's Metropolitan Fire Brigade in 1865 under Eyre Massey Shaw. In 1906, the first motorized fire department was organized in Springfield, Massachusetts, after Knox Automobile of Springfield produced the first modern fire engine one year earlier.

## FIREFIGHTING REALMS

Both urban and rural areas are the domain or realms of firefighting operations. The extent and structure of a city is very important in maneuvering this activity. The combination of poverty, marginality,

*Address correspondence to this author at the Department of Geography, University of Karachi, Karachi, Pakistan; E-mail: shahidgeog@gmail.com

ISSN: 1814-8085 / E-ISSN: 1927-5129/15 

overcrowding and limited service provision if any, exposes residents to a range of prevailing hazards particularly informal dwelling fires. Nearly half the world population lives in urban areas, and numbers are accelerating with more than half of the urban population residing in slums [7]. Uncontrolled urban growth exacerbates fire hazards and vulnerability [8].

Moreover, the informal settlements lack formal site planning and service infrastructure that might reduce fire risk and at the same time make mitigation feasible. Though disasters particularly fires are among man's oldest concerns since pre-history and myth period, they are hardly scrutinized critically to develop effective mitigation [9] and these damages have shown a significant increase in the last one and a half decades [10]. There is an urgent need for a sustained and comprehensive fire disaster reduction strategy. In achieving this, the needs and concerns of all social groups such as poor, rich, men, women, young, old, indigenous or non-indigenous mustbe integrated into the fire disaster reduction policies and measures because the level of vulnerability depends on these social aspects [11].

Additionally high population densities coupled with lack of access *via* roads make it easy for fire to spread between dwellings and difficult for emergency services to reach affected areas. This is compounded by lack of fire hydrants and water mains. The spaces between dwellings are often clogged with potential fuel, from flammable household waste to disused cars [12].

In many slums, especially in poor countries, many people live in narrow alleys that do not allow vehicles like ambulances and fire trucks to pass. The lack of services such as routine garbage collection allows rubbish to accumulate in huge quantities. Lack of infrastructure is caused by the informal nature of settlement and lack of planning for the poor by government officials (Osorio and Hurych, 2004) [13].

## FIREFIGHTING SERVICES IN KARACHI

In Pakistan, fire incidents kill 16500 people and leave 164000 injured or disabled every year across the country but the government has yet to adopt a National Fire Safety Policy in order to control the situation. According to a policy draft, the fire incidents or accidents cause property losses and insurance claims worth Rs 400 billion which is ten percent of the total budget allocations of the country. The metropolises, including Islamabad, Rawalpindi, Lahore and Karachi have been witnessing fire incidents frequently but the basic factors mostly remain a secret or usually named as short- circuiting.

The country witnessed the worst fire incident in Karachi recently that claimed around 300 lives. The Federal Capital is also no exception as it had also experienced inferno incidents at Marriott Hotel, UBL Building and commercial plazas, but on the contrary there exist no Fire and Safety Act in Pakistan. The National Advisory Group on Fire and Safety Policy comprising 26 experts submitted the unanimous draft of the policy to NDMA in 2010, but it is yet awaiting approval from the relevant quarters. Hoping the government to approve and implement the unanimous draft of the National Fire Safety Policy (NFSP) to avoid further losses of lives and properties.

Karachi is the most populous city of the country. At the time of partition in 1947 Karachi was fortunate to have two fire stations established in 1914 and 1937 namely CFS and SFS. After independence first station developed was NFS in Nazimabad in 1968,and then seven other stations developed until 1992. Since then twelve more stations have started their operation. There are other organizations which have their own fire vehicles and other instruments. These organizations are Pakistan Railways, Pakistan Navy, Pakistan Air Force, PIA, Civil Aviation, Steel Mills and KPT.

**Table 1:**

| City | No. of Fire Stations | Population | No. of persons per Fire Station |
|---|---|---|---|
| Karachi | 22 | 23,500,625 | 1068210.23 |
| Lahore | 13 | 14,218,745 | 1093749.62 |
| Faisalabad | 4 | 7,347,446 | 1836861.50 |
| Peshawar | 3 | 2,833,252 | 944417.33 |
| Hyderabad | 3 | 5,607,798 | 1869266.00 |
| Islamabad | 1 | 2,706,481 | 2706481.00 |

## FIREFIGHTING ATTRIBUTES IN KARACHI

On comparing the city with other major cities of the country for number of fire stations, it is evident that Karachi has the highest number of fire stations while Lahore ranks second and all others are lying far behind these cities. In all the stations, the number of persons per fire station is about one million or more except in Peshawar where it is less than one million. For Faisalabad and Hyderabad this value is about 1.8 million which is quite high demanding the establishment of more fire stations (Table **1**).

**Table 2: Karachi: Existing Fire Fighting & Rescue Fleet**

| Description of Units | In Commission |
|---|---|
| Snorkel Simon 103 ft. | 1 |
| Hydraulic Aerial Ladder Platform | 2 |
| (Having 148 working Height) | |
| Command Vehicle | 1 |
| Water Bowsers 44000 liters | 3 |
| Rescue Unit | 1 |
| Foam Tender (Hino) | 1 |
| Rescue Crane / Break Down | 1 |
| Radio Mobile Control Unit | 1 |
| Fire Tender in order | 46 |
| Isuzu tanker feeder 3000GI cap | 2 |
| Fire Trailer Pump (De-watering) | 2 |
| Electric Mast Towers | 4 |
| (Trailer mounted diesel driven) | |

According to Table **2** general existing condition of fire brigade fleet is expressed in which the important point to be noted is the number of fire tenders which in working condition are 46 in total and Figure **1** is showing its station-wise distribution. Here Korangi and Site stations have five and four fire tenders respectively and both of these are located in Industrial areas. Other important stations are Landhi, Lyari, Malir, Nazimabad, New Karachi, Orangi Town and Saddar each with three fire tenders. Snorkels with 103 feet laddersare another important vehicle involved in firefighting in high rise buildings, but it has been observed that buildings more than ten stories are posing huge problems for the fire fighters. Table **3** gives the details of other equipment supporting firefighter which is quite essential.

There are 1311 employees at all the stations (Table **4**) and about 900 are fire men, 224 are drivers together showing more than 85 percent share of employment. A little more than 5 percent are engaged in office work. This certainly shows quite a strength to cope with the mitigation of fire hazards in the city.

## FIRE VULNERABILITY

Vulnerability is a set of conditions that affect the ability of places, communities and individuals to prevent, mitigate, and respond to hazards. It is seen that all individuals and communities are to varying degrees vulnerable to hazards and all have intrinsic capacities to reduce their vulnerability. Vulnerability acts as the dependent component while the triggering agent stands as the independent component of a disaster. This dependent component is determined by the degree of risk, susceptibility, resistance and resilience [14]. In case of fire incidents different places in the city show different levels of exposure to the harmful effects of fire occurrence, this exposure is called the vulnerability and its mitigation and resilience is reflected by the variation in responses of individuals or communities. Sometimes the disaster is enhanced by the action of people thereby enhancing the vulnerability of places.

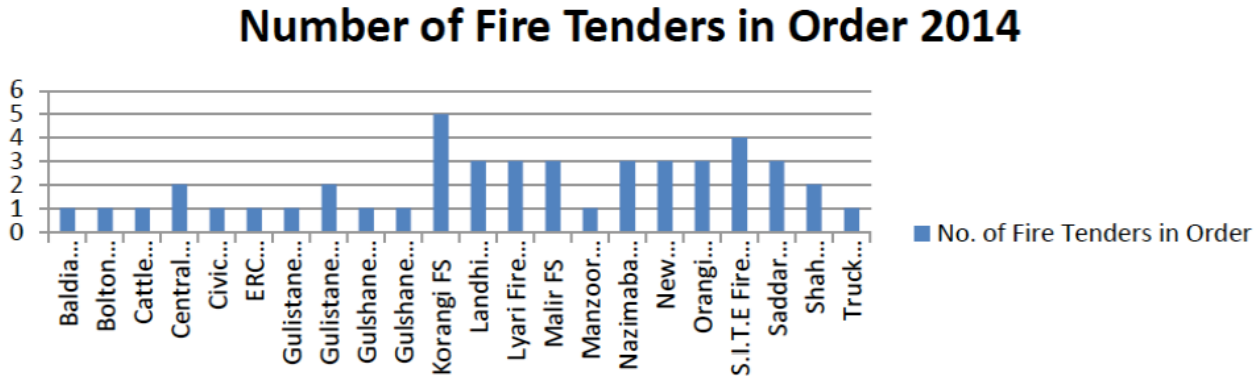


**Figure 1:**

**Table 3:**

| Rescue Equipment | Numbers |
|---|---|
| Expending Units | 6 |
| Metal disc cutting heavy duty | 6 |
| Plasma cutting heavy duty | 1 |
| Concrete cutter heavy duty | 6 |
| Thermal Imagine Camera | 2 |
| Heavy duty drill(electric operated) | 2 |
| **Personal Protective Equipment** | |
| Fire Suit complete in all respect | 100 |
| Rescue Suits complete in all respect | 48 |
| Torches heavy duty rechargeable | 300 |
| Fire helmet | 48 |
| Rescue helmet | 48 |
| Helmet torch | 300 |
| Life belt with life line and safety hook | 48 |
| Fireman axe with pouch and belt | 100 |
| **Firefighting Equipment** | |
| Fire Trailer Pump | 6 |
| High-rise Ground Monitor | 36 |
| Foam Generator Hi Turbid | 24 |
| Foam Gun FB.10 | 24 |
| Foam Inline Inductor | 24 |
| Multipurpose branch pipe | 36 |
| Bolt cutter | 36 |
| Cable cutter | 36 |
| Smoke detector | 6 |
| Breathing apparatus 300 bar | 48 |

Firefighting services in Karachi are quite efficient in providing their services. There are twenty two fire stations which are providing firefighting and rescue services to the city. These services are the most accessible in comparison to the other public services. One can avail the services very easily just by dialing 16, the emergency number of Fire Brigade in Karachi. Almost all the eighteen towns of Karachi have at least one station and Saddar town and Gulshan-e-Iqbal town have three each. Table **5** shows the list of all the fire stations in Karachi. Percent call attended and the incidents tackled by each station are also marked. The data has covered incidents from 2007 to 2014 for these stations. Some part of the data was associated with the act of violence occurred in the city.

**Table 4:**

| Name of post/designation | Numbers |
|---|---|
| Chief Fire officer | 1 |
| DCO | 1 |
| Station Officer | 22 |
| Sub-fire officer | 35 |
| Leading Firemen (all categories) | 117 |
| Firemen | 777 |
| Drivers(all categories) | 224 |
| Ambulance Attendant | 9 |
| **Mechanical Staff/Strength** | |
| Project Engineer | 1 |
| Foreman | 2 |
| Assistant Foreman | 4 |
| Mechanics (All Categories) | 10 |
| Auto Electrician | 6 |
| Fitter | 8 |
| Workers/coolies | 13 |
| **Communication Staff/Strengths** | |
| Wireless Mechanic | 1 |
| Wireless Operators | 10 |
| Telephone Operators | 4 |
| **Administration Staff/Strengths** | |
| Deputy District Officer | 1 |
| Head Clerk | 1 |
| Accountant | 1 |
| Assistant Storekeeper Sr/Jr | 4 |
| Clerks (All categories) | 43 |
| Pesh Imam Sr/Jr | 7 |
| Moazzin | 3 |
| Timekeeper Clerk | 1 |
| Tracer | 1 |
| Cashier | 1 |
| Draftsman | 2 |
| Steno Typist | 1 |

The leading fire stations are Korangi FS, Saddar FS and Central FS all of them are encountered 10% of the fire accidents in the city during these 8 years. These cover mainly the old city areas or major parts of the business hub of the city and the second largest cluster of industries. Besides these there are six other stations marked as major stations covering 6-8% of the incidents individually (applying Thomas Model). Remaining 13 are designated as minor fire stations.

**Table 5:**

| FIRE STATIONS | Percent Calls Attended |
|---|---|
| Korangi FS | 13.90 |
| Saddar Fire Station | 10.91 |
| Central Fire Station | 9.94 |
| Gulistan-e Mustafa FS | 7.92 |
| Nazimabad Fire Station | 7.63 |
| New Karachi Fire Station | 6.95 |
| Landhi Fire Station | 6.66 |
| Orangi Fire Station | 6.47 |
| S.I.T.E Fire Station | 6.08 |
| Gulistan-e Jauhar FS | 3.67 |
| Lyari Fire Station | 3.47 |
| Malir FS | 3.09 |
| Manzoor Colony Fire Station | 2.99 |
| Shah Faisal Fire Station | 2.70 |
| Gulshane Iqbal FS | 2.61 |
| Bolton market | 1.93 |
| Civic Center FS | 1.54 |
| Gulshan-e Maymar FS | 0.87 |
| Cattle Colony FS | 0.58 |
| Baldia Town Fire Station | 0.10 |
| ERC Hawksbay | 0.00 |
| Truck AddaFS | 0.00 |
| Total | 100 |

Fire calls distribution for 2000-2013 have been shown in Table **6**. More than 49.5 thousand calls were received out of which about 96% were the fire calls, 1.3 percent were false calls and 2.2 percent rescue calls. Calls show an increasing trend overall but higher number of calls was recorded in the intervening years which clearly shows that the initial period of General Musharraf's regime was relatively peaceful but at its culminating point i.e., 2008 the unrest in the country was reflected specially after the assassination of Benazir Bhutto the former Prime minister of Pakistan. The entire period was marked as an imprint of violence. Subsequent to the establishment of next government the fire incidents reduced.

## SPHERE OF EFFECTIVENESS

The area of immediate response is marked by buffers of 2km. radius from each station (Figure **2**). Only five stations whose area of influence does not override with each other are Cattle Colony, Landhi, Korangi, Malir and Manzoor Colony. All of them are representing Karachi East. All other stations have some area in common within the range of 2 kilometers. Time taken to these areas is up to 15 minutes maximum just after receiving the call.

Figure **3** reveals an extension of the area of effectiveness up to 5km. It appears that almost all the stations sharing some of the area with their neighboring stations covering major part of the city in order to serve

**Table 6:**

| Year | Fire Calls | Rescue Calls | False Calls | Total Calls | Loss of Lives |
|---|---|---|---|---|---|
| 2000 | 2479 | 51 | 55 | 2585 | 2 |
| 2001 | 2804 | 57 | 13 | 2874 | 40 |
| 2002 | 2745 | 53 | 28 | 2826 | 27 |
| 2003 | 3757 | 285 | 51 | 4093 | 63 |
| 2004 | 3942 | 76 | 69 | 4087 | 40 |
| 2005 | 4205 | 47 | 52 | 4304 | 27 |
| 2006 | 4129 | 137 | 58 | 4324 | 21 |
| 2007 | 4063 | 66 | 71 | 4200 | 25 |
| 2008 | 4534 | 57 | 47 | 4638 | 16 |
| 2009 | 4069 | 95 | 112 | 4276 | 32 |
| 2010 | 3604 | 43 | 48 | 3695 | 12 |
| 2011 | 3716 | 68 | 48 | 3832 | 2 |
| 2012 | 3077 | 48 | 3 | 3128 | 300 |
| 2013 | 661 | 8 | 0 | 669 | 0 |
| Total | 47785 | 1091 | 655 | 49531 | 607 |

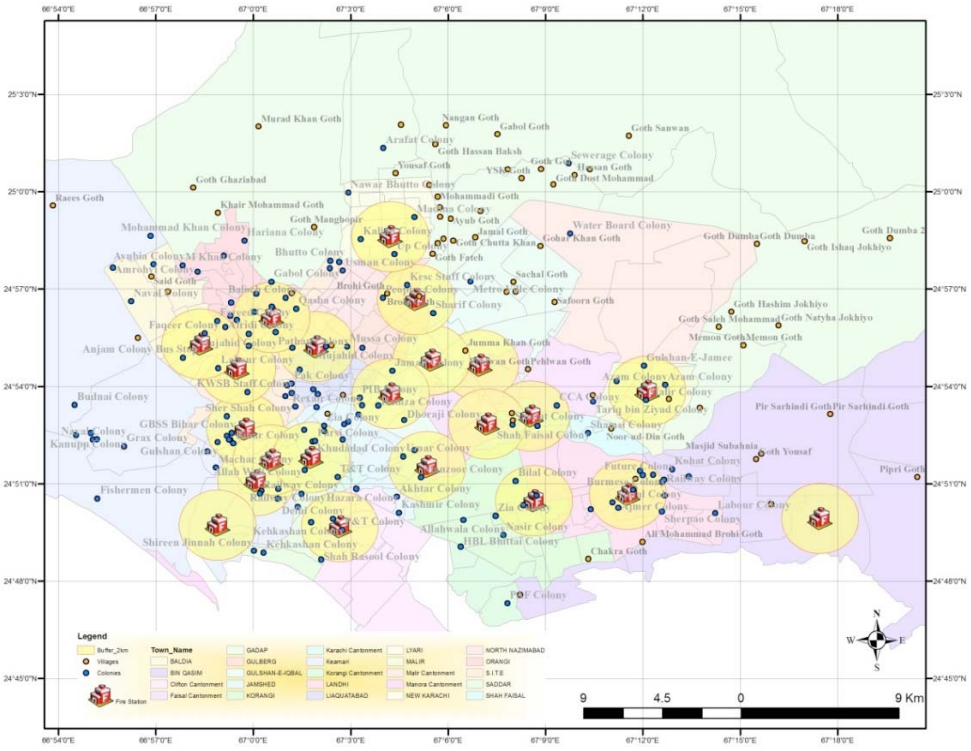


**Figure 2:** Area of Immediate Response, Marked by Buffers of 2km Radius. (Source: Author).

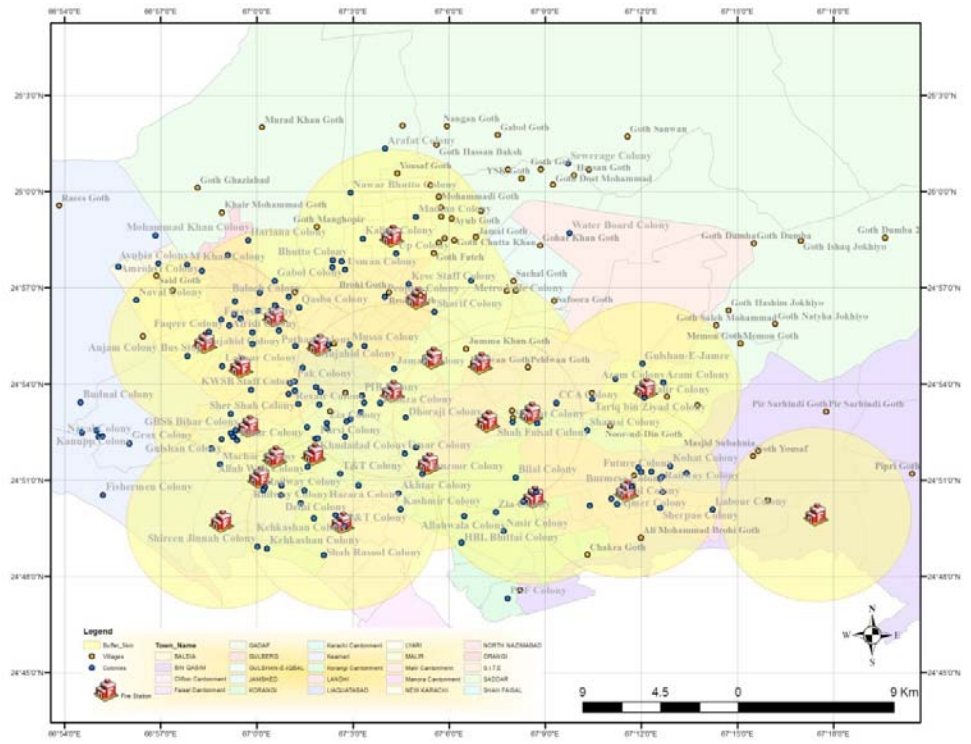


**Figure 3:** Sphere of Effectiveness with 5km. Radius (Source: Author).

efficiently. Several squatter settlements have been found to the outskirt of this 5km. influence level, but even these areas are reachable within a maximum of 30 minutes time.

## MAJOR PROBLEMS IN FIREFIGHTING

Major firefighting problems are faced in high rise structures specially the buildings with more than 100

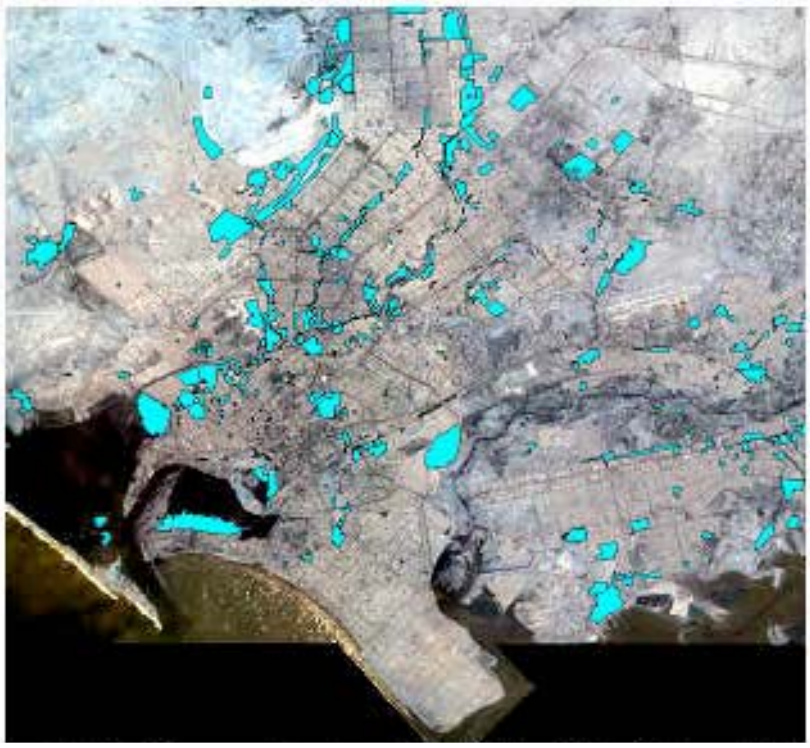

**Figure 4:** Katchi abadis marked on satellite data (year 2005). (Source: SUPARCO Website).

feet height, areas with narrow streets especially in *Katchi Abadis* (Figure **4**) and other slums. Over 40 percent of the population in our cities lives in substandard housing, in squatter colonies, with no security of tenure [15]. Other problems include absence of coordination and cooperation of different agencies on the scene of incident. The government has also shown lack of interest in the provision of this essential service to the people. Acute shortage of water supply for firefighting purpose has been observed as few fire stations have their own water hydrant. Subsoil wells are required for each fire station for abulk supply of water. Besides, there are some community based problems such as none provision of fire preventive and firefighting systems in factories and other commercial and residential buildings.

## SUGGESTIONS

Following are some suggestions to regain the strength in proper functioning of these services. The government must take measures to improve the infrastructure by the provision of hydrants to each fire station and proper equipment and trained personnel. It must release funds in time for its proper functioning in order to avoid the occurrence of the current event of coming on record as a defaulter of Rs. 120 million to PSO (Pakistan State Oil) for the fuel.

Provision of tube wells within each station may be a low cost venture to fulfil the need of water. Such wells can also be developed in other parts of the city especially within industrial zones. Since high rise buildings pose problem in rescue and firefighting work therefore support of helicopters are essentially needed. Furthermore rope ladders and manually operated elevators are other good options for rescue works. A training exercise is needed, in which building occupants are familiarized with building evacuation, and total building evacuation, in accordance with an EAP (Emergency Action Plan). The same training is essential for industrial workers. Similarly, the awareness programs for general public can be run with the help of media may also prove to be helpful in coping with such disasters.

## CONCLUSION

In Karachi, the fire incidents have shown an overall increase not only because of increasing population but also rising factor of violence, besides the quick development of high rise structures and other buildings and industries without observing regulations of fire safety which give way to fire accidents. Similarly, the deteriorated system of electrical wiring in the buildings specially the old ones are making these areas vulnerable to fire incidents. Squatter settlements are other important areas prone to this disaster. Generally,

fire tenders reach the incident place almost in no time but heavy traffic flow in the old city makes it difficult to reach the destination in short notice. Major part of the city is covered by the services of these fire stations in operation within five kilometer limit of influence area. All stations coordinate with each other if the fire is of a more serious nature. Clifton and Gadap near Toll Plaza, a sub-station of fire brigade is needed to further strengthen the network of services. Furthermore, the coordination and cooperation of other agencies can enhance the effectiveness of the services provided by the fire and rescue department of Karachi Metropolitan Corporation. The economy thrives and business grows when people have confidence in investing and then all can be attained through ensuring maximum safety standards and well-being of the citizen. The possibility of fire, arson, blasts whether it be accidental or terrorist activity cannot be overlooked in emerging economics like that of Pakistan. Economy grows and flourishes when laws of safety are properly addressed and welfare is the primary objective.

## REFERENCES

[1] Cote AE. Basics of Fire and Fire Science. Organizing for Fire And Rescue Services. Jones Bartlett Publishers 2003; p. 92. ISBN 978-0-87765-577-0.

[2] Dillon M, Garland L. Ancient Rome: From the Early Republic to the Assassination of Julius Caesar 2005; ISBN 9780415224581.

[3] Klinoff R. Public Fire Protection. Introduction to Fire Protection, 3rd Edition. Thomson Delmar Learning 2007; p. 59. ISBN 978-1-4180-0177-3.

[4] Grace K. Irish Cincinnati. Arcadia Publishing 2012; p. 44. Retrieved 2013-05-06.

[5] Hensler B. Crucible of Fire: Nineteenth-Century Urban Fires and the Making of the Modern Fire Service. Potomac Books, Inc. 2011; pp. 1-2. ISBN 978-1-59797-684-8. Retrieved 4 October 2011.

[6] Braidwood J. James Braidwood and the London Fire Engine Establishment (LFEE). London Fire Brigade 2011. Retrieved 2011-10-04.

[7] Pelling M, Wisner B. Disaster Risk Reduction. Case from Urban areas of Africa. Earth scans Publishers: London, UK 2009.

[8] Spaliviero M. Integrating slum upgrading and vulnerability reduction in Mozambique. Open House International 2006; 3(1): 106-115.

[9] Jaya Kumar GS. Disaster management and social development. International Journal of Sociology and Social Policy 2000; 20(7): 66-81. http://dx.doi.org/10.1108/01443330010789007

[10] Shaluf IM, Hamden F, Said AM. A review of disaster and crisis. Disaster Prevention and Management 2003; 12(1): 24-32. http://dx.doi.org/10.1108/09653560310463829

[11] ISDR. Women, Disaster Reduction and Sustainable Development, UN/ISDR, Geneva 2002.

[12] GOK. Feasibility study on fire disaster prevention and management: Municipal councils of Nyahururu, Nyeri, Nanyuki and Thika. Nairobi: GOK 2004.

[13] Osorio NL, Hurych J. Literature of disasters from the human factors point of view: a descriptive analysis. Collection Building 2004; 23(2): 64-72. http://dx.doi.org/10.1108/01604950410530390

[14] McEntire DA. Triggering agents, vulnerabilities and disaster reduction: towards a holistic paradigm; Disaster Prevention and Management 2001; 10(3): 189-96. http://dx.doi.org/10.1108/09653560110395359

[15] Hassan A. Pakistan Administrative Staff College Lahore and UN Coordinators Group for South Asia; Workshop on Initiatives in Grassroots Participation: NIPA Karachi 1985.

Received on 15-02-2015 Accepted on 28-02-2015 Published on 05-03-2015

http://dx.doi.org/10.6000/1927-5129.2015.11.26