

# Fires on Buildings: A Needed Study



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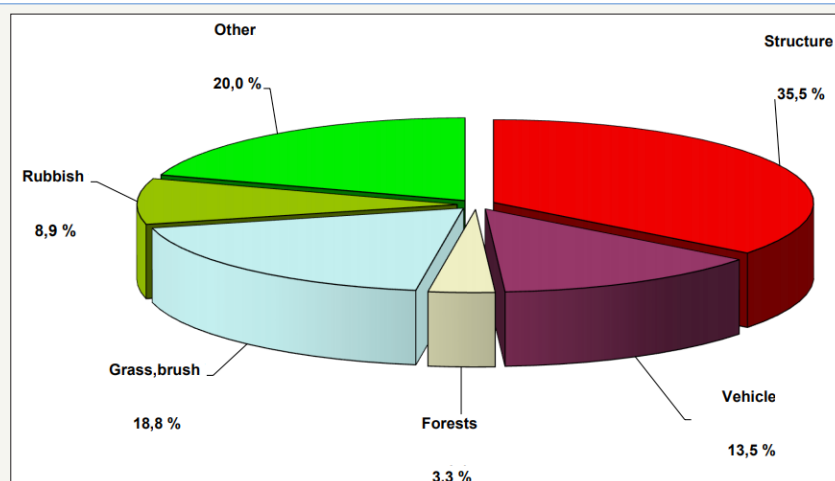
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## Introduction

Fires on buildings (comercials, services, factories or residential) are extremely frequent all around the world. It is estimated this type of fire takes around one third (1/3) of all the recorded events. Figure 1 confirms this statement in a study made in thirty-nine (39) countries around the world [1]. The damages that derive

from these fires are considerable, specially the economic losses in consequence of the interruption of activities or even productive chains, promoting the “run-out of jobs” [2], over the significant amount of money that are set for the rebuilding process of damaged or even destroyed structures [2,3].



**Figure 1:** Occurrences of fires in the world during the year of 2016 [5].

The United States of America (USA) have recorded 1.6 millions of fires during 2005, with 3,677 deaths, and 83% of these deaths have happened in fires on buildings [4]. Every year hundreds of deaths and billions of dollars in losses of properties happen because of fires [5]. Drysdale [6] says that in The United Kingdom (UK) the amount of direct losses from fire, like physic properties, human lives, and in the production chain, reach more than £1 billion pounds and more than 800 deaths every year.

In the USA the financial losses derivate from fires are close to 85 billion dollars, according to Quintiere (1998). Canada has an annual outcome for fires around 11 billion Canadian dollars, based on 1991 and numbers according to Schaeffer et al. [7]. Denmark had, during 1998, spends with fires that reach 10.825 million Danish crowns [8]. The cost of fires represents 0.813% of the Gross National Product (GNP) of the USA, 0.864% of the Danish GNP, and 0.729% of the UK GNP, according to Ramachandran [9].

**Table 1:** Direct Losses and Deaths during Fires [10].

Country	Direct Losses (in billions of Euros)				Deaths in Fires			
	2005	2006	2007	%GNP	2005	2006	2007	Deaths/100,000 Inhabitants
Germany	2.9	3.3	3.4	0.13	605	510	-	0.68
USA	8.3	9	11.4	0.1	4000	3550	3750	1.23
France	3.4	3.3	3.4	0.19	660	620	605	1.02

UK	2.1	1.8	1.8	0.3	515	515	465	0.82
Japan	2.3	2.4	2.1	0.12	2250	2100	2050	1.67

Table 1 presents the outlay with direct losses and deaths because of fires, from 2005 through 2007, according to Geneva Association [10]. Not less evident are the social losses related to fires on buildings that cause, over the temporary of definite unemployment, the eviction of families that have lost their most precious property, their residence. Regarding the social effects of fires [11] takes attention the conflicts and familiar damages derivate from deaths and serious injured. Overall this, the sensation of insecurity and helplessness that gets every viewer of these fires, especially when helped lately or delayed, aren't taken into consideration in this study.

In this context, the urban agglomeration are part of the geographic layout of Brazil, and other Latin American countries, cities with substantial population densifications, full of natural and specially anthropic risks, causing the increasing of many types of sinister, like: spilling and overflow of dangerous products, car accidents of many modalities, structural collapses, among other undesired events. Among these events, the fires on buildings or built areas deserve special attention. So, the mapping, description of structures, the constitution of burned objects and their heat capability, the regional and local patterns of the fire dynamic, are emergent premises for effectively face the matter [12-14].

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