



# State of Lebanon's wildfires in 2008

“This report was produced within a collaborative framework between the Department of Ecosystems at the Ministry of Environment and the Biodiversity Program at the Institute of the Environment, University of Balamand”.

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## 1. SCOPE

In 2013, a collaborative work was initiated between the Ministry of Environment (MOE) and the Institute of the Environment, University of Balamand (IOE-UOB), regarding the execution of the data analysis related to wildfires in Lebanon. The main goal of this collaboration is to produce a yearly report on wildfire occurrence and the extent of burned areas in Lebanon.

The analysis is done based on the data provided in the fire ID cards filled in by the Internal Security Forces (ISF) and copied to the Ministry of Environment, knowing that the fire ID cards format was issued through the notification of the Presidency of Council of Ministers number 256 dated on 1/3/2008.

The report comes in line with the highlights of the technical requirements of Lebanon's National Strategy for Forest Fire Management (endorsed by Council of Ministers Decision No. 52 dated 13/5/2009) by working towards the unification of fire information and data as a means to empower efforts in understanding better the problem of wildfires in Lebanon.

## 2. FIRE DANGER IN THE 2008 FIRE SEASON

The calculated start date of the fire danger season for 2008 was 22 April, 2008 and the calculated end date was 14 November, 2008. The peak month was August (a total of 44 fires damaging 520 ha of vegetated land).

## 3. FIRE OCCURRENCE AND AFFECTED AREAS

In 2008, a total of 230 fires were reported (Annexes 1 and 2), affecting a total area of 1070 ha (Figure 1)

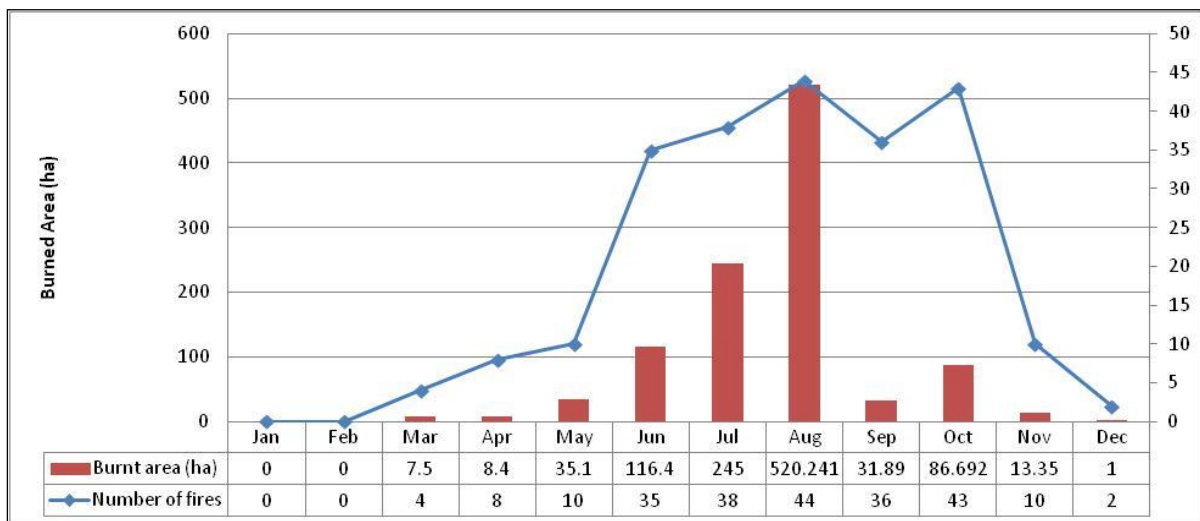


Figure 1: Monthly distribution of fire occurrence and fire affected areas

The landuse of fire affected areas (Figure 2) comprised mixed land use (38%), forests/woodlands (33%), agricultural land (12%), and grassland (7%); 53% of fire affected lands were privately owned and 29% were public lands.

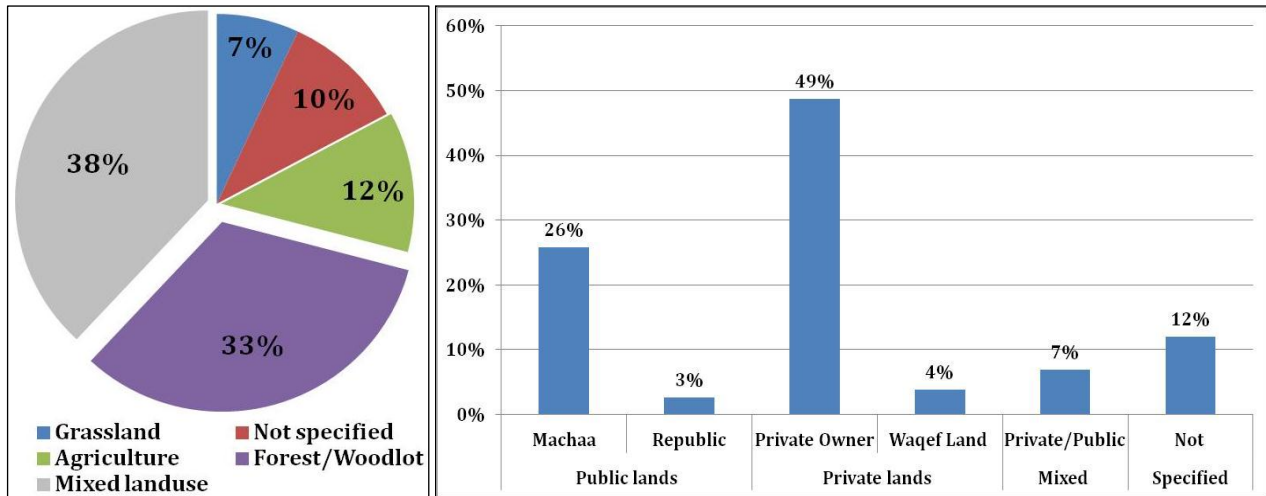


Figure 2. Landuse of fire affected areas (left) and ownership of fire affected areas (right)

Wildfires occurred in 22 out of 26 Cazas. More specifically, the Cazas of Sour, Chouf, and Sayda were affected by 34, 32, and 18 fires, respectively; while the Cazas of Jbeil, Zgharta, and Chouf were affected by 444 ha, 134 ha, and 88 ha of burned areas respectively (Figure 3).

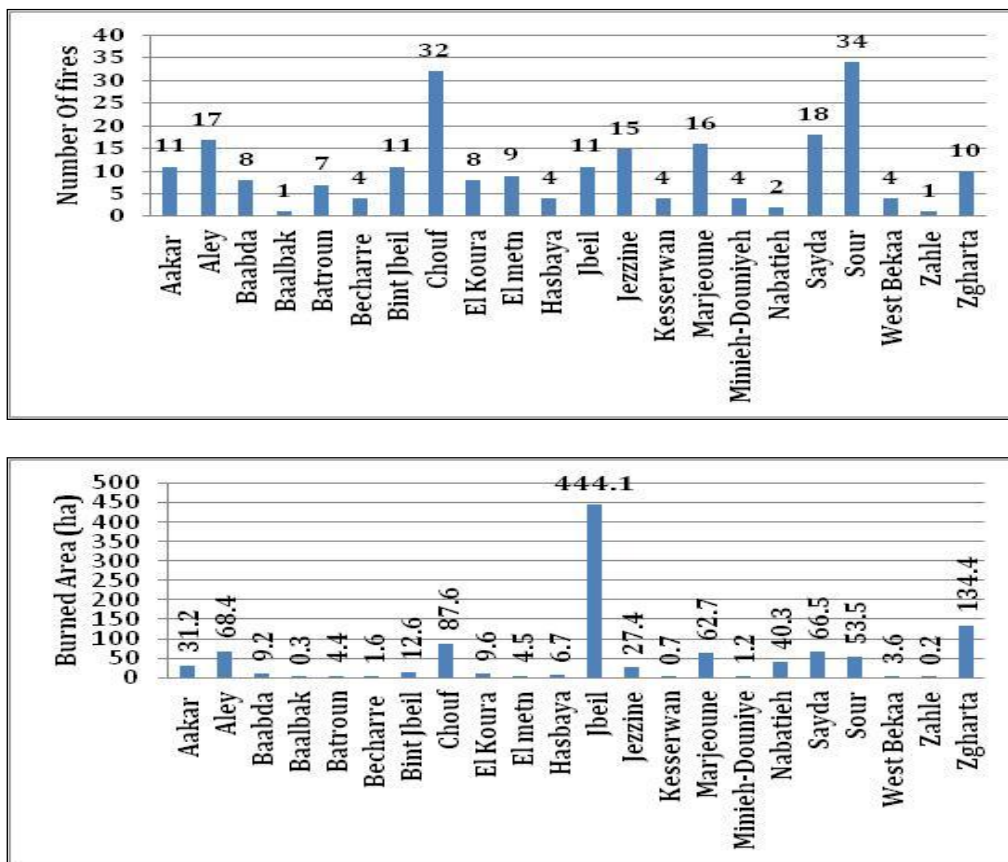


Figure 3. Distribution by Caza of fire occurrence (upper), and burned areas (lower)

Mountainous areas were affected by the largest number of fires and the largest extent of burned areas, followed by valleys and plains consecutively (Figure 4).

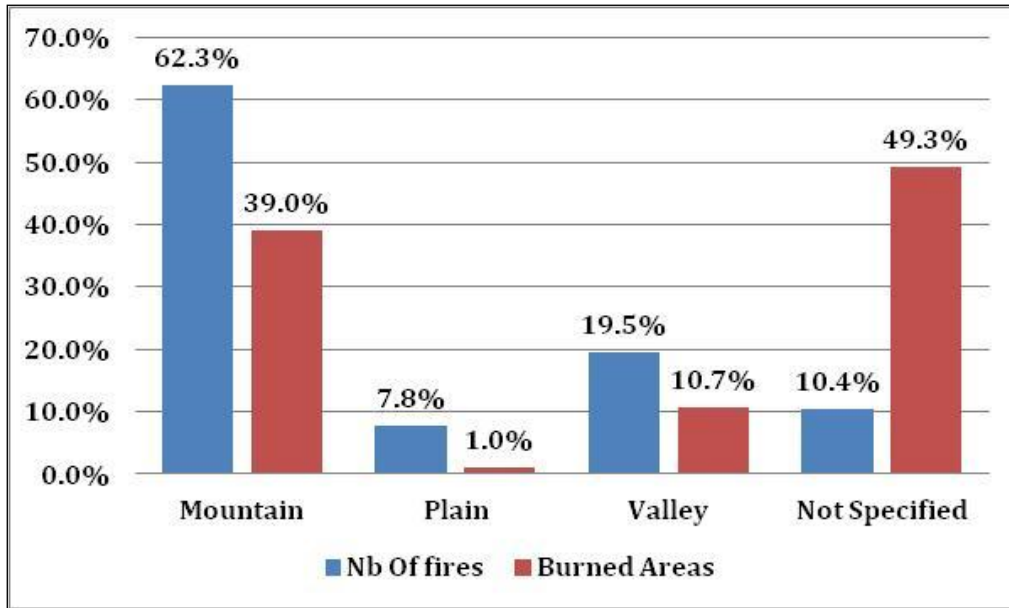


Figure 4. Land type affected by fires

Fire-affected type (Figure 5) consisted of 42% of needle forest (e.g. *Pinus sp.*), followed by mixed forest (11%), grassland (9%), mixed forest/agricultural land (9%), mixed grassland/agricultural land (8%).

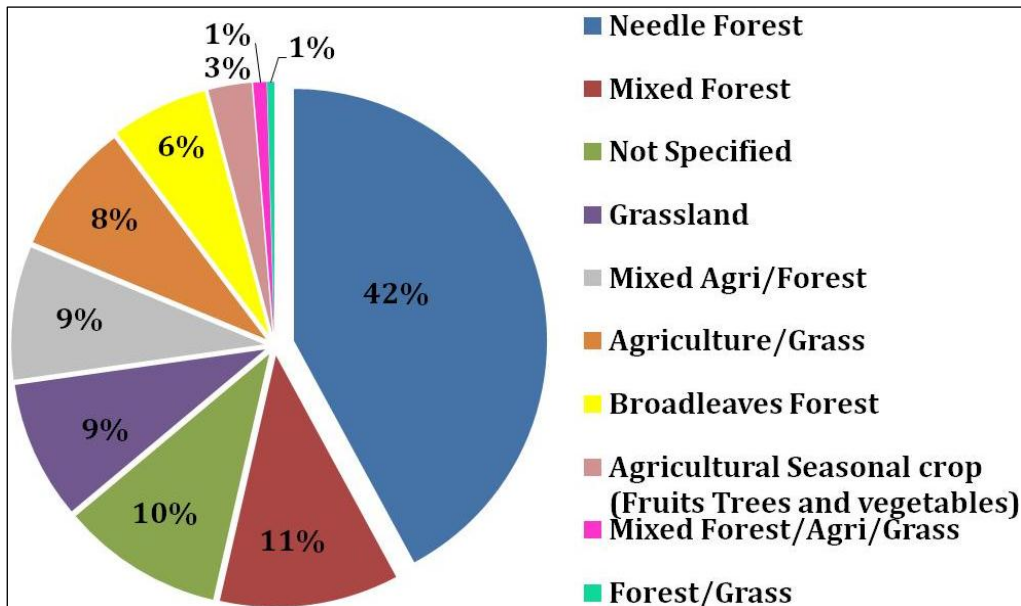


Figure 5. Distribution of fuel type affected by fire

#### 4. CAUSES OF FIRES

The main fire causes were unknown (57%). Negligence was reported as the main cause of fires for 26% of the reported fire events; 11% of causes involved human activities on natural lands. Arson fires represented only 4% of the total causes (Figure 6).

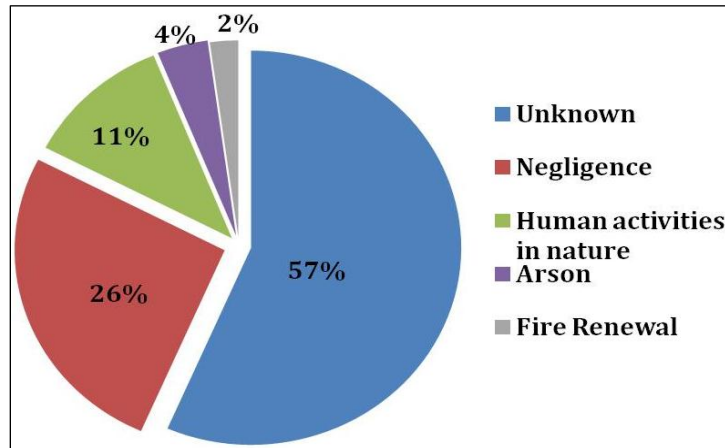


Figure 6. Distribution of main fire causes

#### 5. FIRE FIGHTING MEANS

##### Reporting

Local residents reported 40% of fire incidents, while 26% of fire incidents were reported by internal security patrols, 4% by farmers, and 18% by others. Forest guards reported only 0.4% of fires. Around 11% of fire incident reporting was not specified (Figure 7).

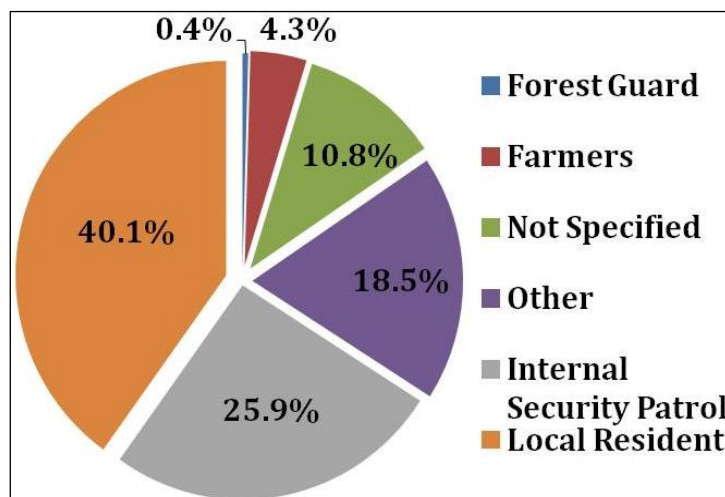
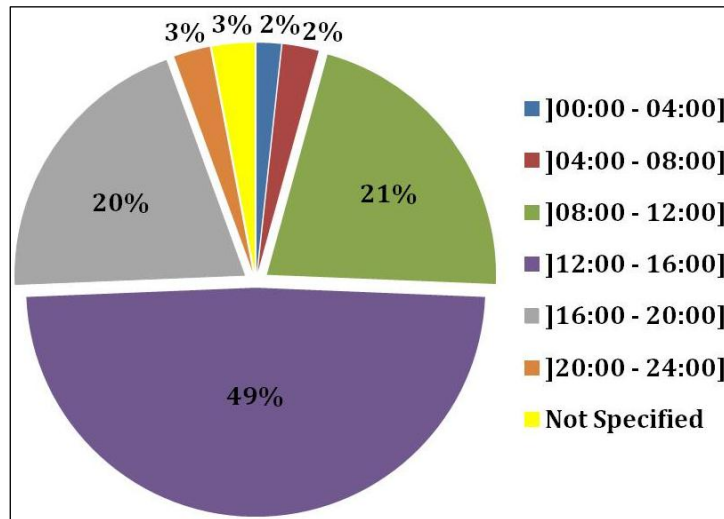


Figure 7. Fire reporting individuals/agencies

*Fire starting time*

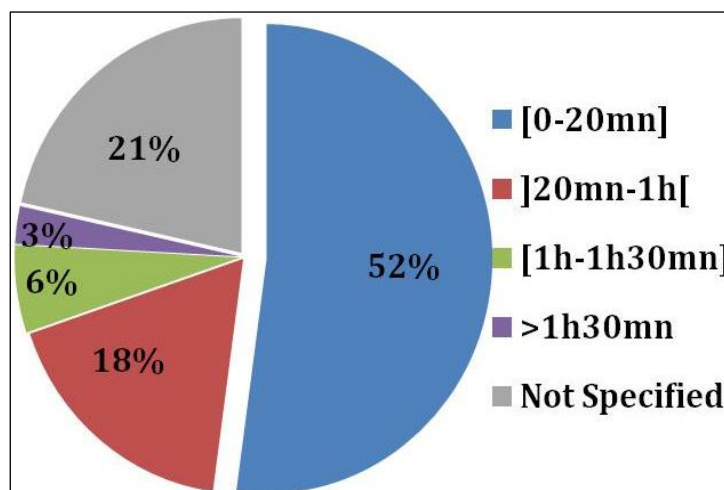
Most of the fires started between noon and 4 pm (49%), and 21 % of fires started between 8 am and noon. In addition, 20% of fires started between 4 pm and 8 pm. (Figure 8).



**Figure 8. Distribution of temporal fire occurrence**

*Intervention time*

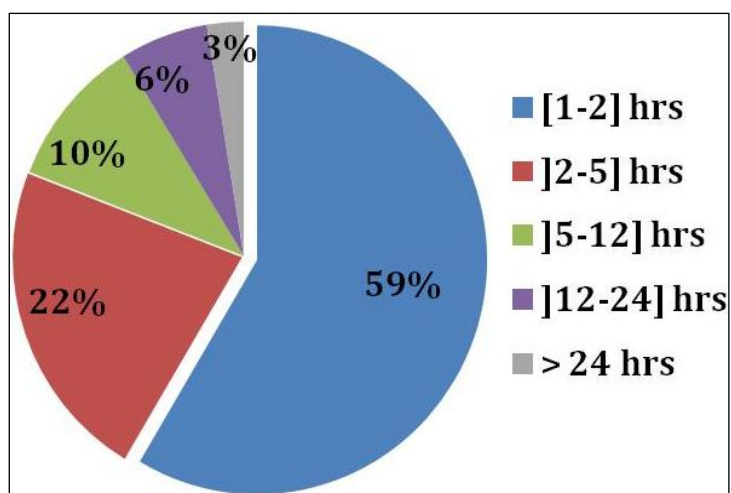
It was observed that 52% of first interventions in fire suppression occurred within the first 20 minutes after reporting time, while 18% of fire interventions happened after 20 minutes and before 1 hour from reporting time. Only 3% of interventions in fire suppression happened after one hour and a half from the reporting time. This was mainly due to lack of firefighting means (Figure 9).



**Figure 9. Times for intervention after reporting fires**

*Fire duration*

The largest number of fires lasted between 1 to 2 hours (59%); 22% of fires lasted between 3 and 5 hours and 10 % of fires lasted between 6 and 12 hours. Only 6 % of fires lasted between 12 and 24 hours, and 3% of fires lasted more than 24 hours (Figure 10).



**Figure 10. Fire duration**

*Resources employed in fire suppression*

The following human and technical resources were involved in fire suppression:

	Nb. of Small Cars	Nb. of Water Tanks	Nb. of Other Cars	Nb. of Human Resources	Lebanese Army helicopters
<b>Civil Defense</b>	94	343	7	865	
<b>Army</b>	54	5	9	556	17 interventions
<b>Internal Security</b>	138	10	20	494	
<b>NGO</b>	9	0	5	53	
<b>Local Resident</b>	0	0	0	369	
<b>Total</b>	<b>295</b>	<b>358</b>	<b>41</b>	<b>2337</b>	

**Table 1. Human and technical resources**

### 6. FIRE SEASON OVERVIEW

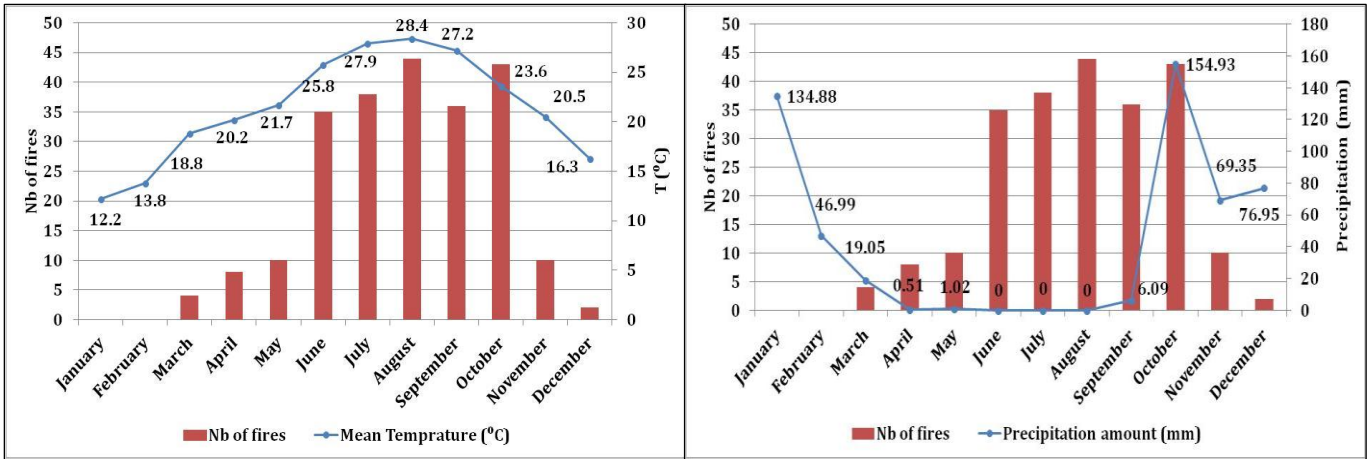


Figure 11. Fire occurrence in function of monthly mean temperature (left) and monthly mean precipitation in 2008 (right)

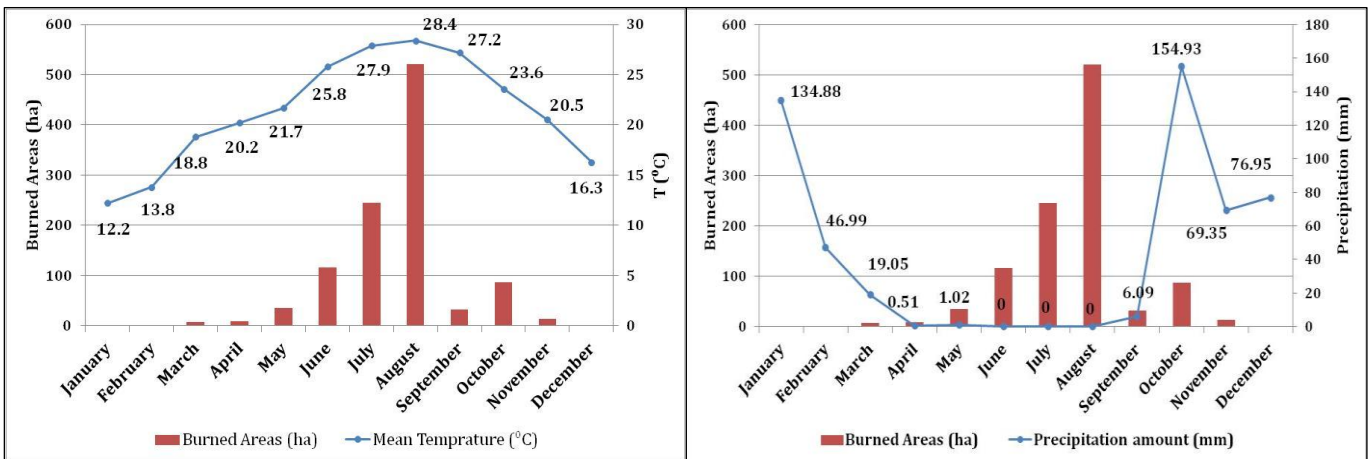
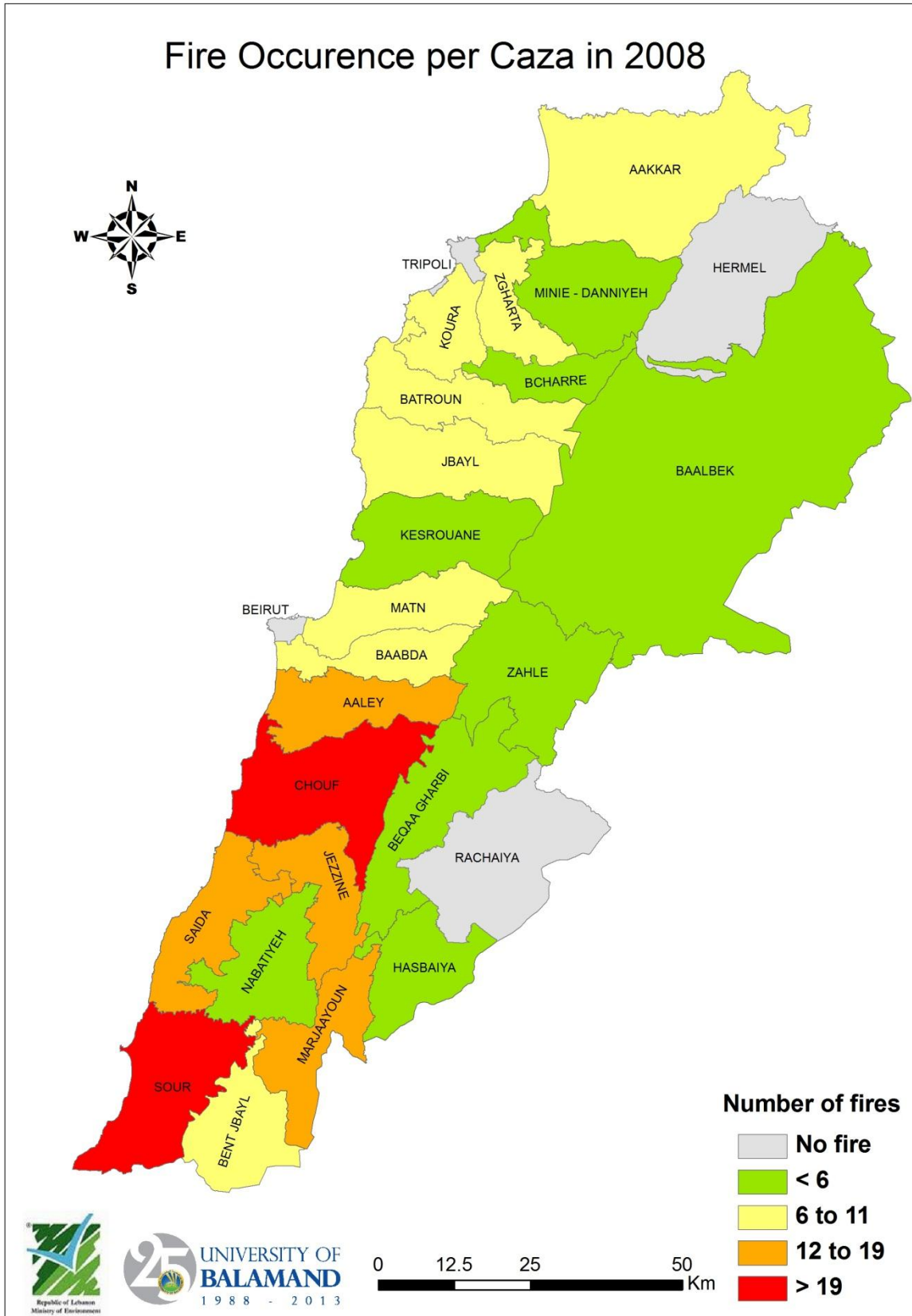


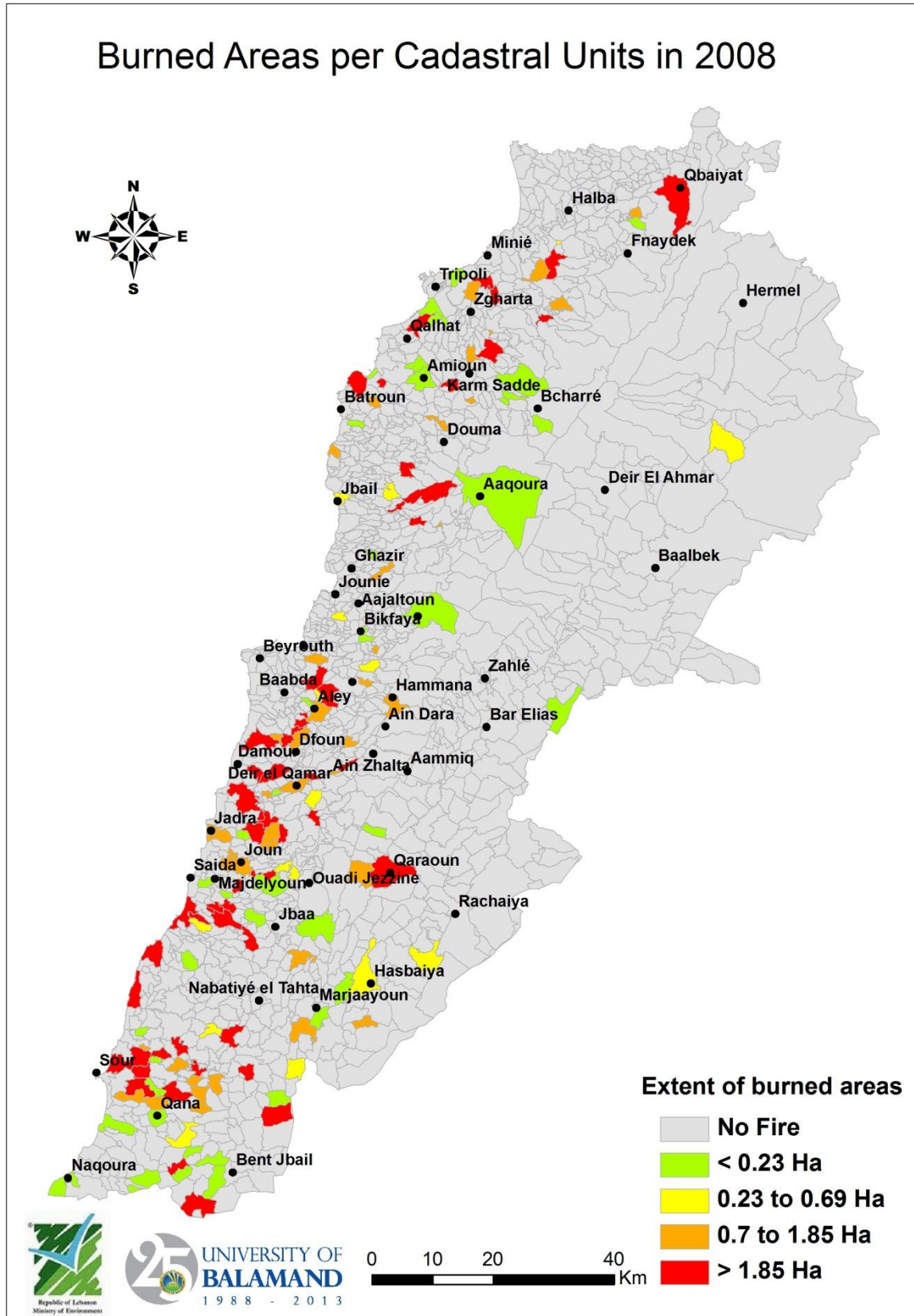
Figure 12. Burned areas in function of monthly mean temperature (left) and monthly mean precipitation in 2008 (right)



Annex 1: Fire occurrence per Caza in 2008



**Annex2:** Extent of burned areas per cadastral units in 2008



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