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## Making Cities Resilient: My City is Getting Ready!

World Disaster Reduction Campaign 2010-2011

Funchal is getting ready!

### Funchal, Madeira Island, Portugal

Funchal is the capital of Madeira Island, with an area of 76 km<sup>2</sup> (10,3% of the island). The municipality is administratively divided in ten parishes: *São Martinho, Santo António, São Pedro, São Roque, Monte, Imaculado Coração de Maria, Santa Luzia, Sé, Santa Maria Maior and São Gonçalo.*

The municipality with 112,015 inhabitants, in the 2011 census, has a relevant number of occurrences throughout the centuries of natural hazards, which have caused victims and huge destruction, such as flash floods, landslides, mudslides, rock fall, storms, storm surges and forest fires.

#### Description of the hazards and vulnerability profile of the city

The historical records reviewed so far revealed that the flash flood which caused more fatalities occurred in 9<sup>th</sup> of October 1803. Official figures report the existence of 600 dead, although a letter from that season points to 1,000 people dead and missing, mostly in Funchal, at that time the municipality had approximately 25,000 inhabitants and the island population was around 90,000.

In 1993, on October 29<sup>th</sup> a flash flood, considered one of the most violent to hit the city of Funchal, left a unrecognizable, confused city with the balance of five dead, four missing and about 400 evacuees, high losses in public infrastructure and private sector facilities, and millions of euros in destruction.

The marina of Funchal retained large amount of debris and some human bodies.



Source: José Lemos Silva

The lower part of the capital city was covered in mud, rocks and logs. Many shops were destroyed and flooded, and warehouses were destroyed along the banks of streams. Roads were impassable and some bridges were destroyed. Schools closed and there was shortage of drinking water for two weeks in various locations in the city. Many vehicles were swept away by the waters.

In the parish of Santo António, the access to Curral das Freiras was hit by the storm, being the most serious case, the site of Vasco Gil, where a school and a van were destroyed. Several homes in this same place were affected by the flood brought by the local stream. In the same parish, near Ribeira Grande, a house was literally devastated by the flood, carried by the stream of São João.

The municipalities of Câmara de Lobos, Santa Cruz and Machico, were also scenes of tragedy, but there were no deaths. The predictions of the Institute of Meteorology and Geophysics of Madeira, for the 29<sup>th</sup> of October, in the statements made to the media, were of bad weather conditions and heavy rainfall and wind. According to the same institute, "This depression was moving slowly to the northeast."

29<sup>th</sup> October 1993 surprised all the locals. Destroyed, flooded, devastated and death recalled other similar historical events that happened in the city of Funchal, in particular the flood of 09<sup>th</sup> October 1803.



Source: José Lemos Silva

The year 2010 has proven to be exceptionally serious. Flash floods have occurred in several occasions (2<sup>nd</sup> of February, 20<sup>th</sup> of February, 21<sup>st</sup> of October, 25<sup>th</sup> of November). On 20<sup>th</sup> of February, the three streams that cross the municipality showed once again the violence and the enormous strength that the inhabitants and visitors of municipality have to face.



Source: Unknown

The materials transported by the streams that cross the city of Funchal were deposited in the downtown, causing a significant destruction of shops, cars, etc. The material removed from the streets and infrastructures was placed over a small pebble beach, which caused the alteration of the shoreline, south of a main avenue of the city (*Avenida do Mar*), the consequences for the functioning of the port and the movement of waves and tides within the bay are still unknown.



Source: Sónia Dória

In total there's 36 flash floods registered. Due to the physical characteristics of the island during the flash floods events, there's an increase of the erosion towards the bases of the slopes which eventually leads to geological hazards like landslides and mudslides, which have a huge capacity of destruction of equipment and generate mortal victims.

Forest fires are the second most important type of hazard on the island of Madeira. It's not a natural disaster, because in this island there isn't a historical record of a fire caused by the dry lightning. The fires in Madeira are always of human origin (crime and negligent fires) and usually in areas of scrub or monoculture forest of exotic trees (eucalyptus, acacia, pine), spreading later to the areas of indigenous forests. The last major fire occurred in August 2010. According to figures released by the Regional Directory of Forests, the fire devoured 8900 ha of vegetation, which corresponds to 11% of the area of Madeira.

This disaster was particularly serious, leading to the loss of biodiversity in the bushes on the top floor of phytoclimate and the heat that causes the fracture of the basalts on the central

ridge. Briefly, we can say that on Madeira Island, the most frequent hazards have essentially been flash floods in the autumn and winter and forest fires in the summer.

The vulnerability issues of the Funchal municipality are due to a highly urbanized territory and a population that is unaware or insufficiently sensitized about the correct behavior in risks and hazards situations.

### **Disaster Risk Reduction activities**

The structure of the municipal civil protection is making some progress in reducing vulnerability. The development of the Municipality Emergency and Civil Protection Plan was the first step towards understanding the hazards and to which extent they could affect the municipality.

To improve the local hazard mapping and disaster risk management and studies is another goal for the municipality.

Awareness and public information, though the budget is very limited to these projects, needs reach the common citizens and give them the correct tools and knowledge, so that the population is involved by organizing voluntary groups in which the behavior in disaster occurrences is one of resilience.