Abstract

Natural disasters caused by flood inundations are among those which cause the most casualties and economic loss in Spain. Accordingly, there is a variety of European, Spanish, and Autonomous Region legislation relating to the management and mapping of flood-prone areas.

Since floods may stem from various origins, there are different types of floods (natural/artificial, inland/coastal, flash floods/rising periods, *in-situ* flooding), and the effects of some may be aggravated by human activities (deforestation, earthworks, urbanization). Floods in Spain can be grouped into four broad risk areas: flash floods in the Mediterranean catchment basin, torrential floods in the mountain ranges, rising periods in the middle and lower reaches of big mainland rivers, and waterlogging in flat and endorheic areas in the central part of big basins.

Following are some of the effects and impacts of floods: water depth and residence time, flow velocity, erosive capacity, sediment transport and deposition, and other associated geological phenomena (landslides, piping, etc.).

There is a variety of existing national and international projects which can be used as references and examples for mapping risk and hazard of floods. There are also multiple sources of information: mapping (topographical, thematic, photographic), alphanumeric (hydrometeorological and socioeconomic) and fieldwork. As regards the surveying methods, flood hazard analysis techniques can be divided into three broad groups: historical-palaeohydrological, geological-geomorphological and hydrologic-hydraulic. The ideal approach is to use all of them in an integrated, calibrated fashion in which they complement one another. There is a wide range of elements which can be represented on the maps and a variety of systems for graphically representing them. Whether or not they are included depends on the map scale, mapping method used and the map´s intended purpose. Hazard can be mapped in three zones (high, medium, and low) for which boundaries and usage restrictions must be established. Likewise, different tools may be used to prepare these maps, both for hazard analysis and integrating risk factors.

To conclude, risk mitigation measures may comprise predictive, preventative and corrective strategies. The ideal approach involves the use of spatial planning as a non-structural preventive measure.