

STRUCTURAL ACTIONS FOR MITIGATION AND PREVENTION OF THE EFFECTS OF THE FLOOD IN THE TOWNS OF SOUTHERN REGION OF MURCIA

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I. PRESENTATION

In an area like Southern Region of Murcia where low rainfall is a major feature of the prevailing climate, the occupation of the valleys and coastal basin adjacent to it, has been related to the main river courses. Agricultural practice, base of the economy of this area, is in close dependence on the availability of surface water resources.

In this sense, the phenomenon of flooding, considered as risk is complex, due to the profound overlap between the conditions of the use of water in an area where it is scarce and the extent to which this use increases, sometimes dramatically, the possibility of events with catastrophic outcome. Achieving permanent advantages seems to manifest itself more than the occasional net possibility of crisis, especially as the intensities of these are not, much less homogeneous and frequently are shown as those more easily tolerated in their ability to damage (CALVO GARCIA-TORNEL, F. 2006).

Among the creative use of welfare and the occasional disaster, human groups have been settling in sensitive areas of flooding, face, permanently, the challenge of establishing safety thresholds, which are diverse and vary over time, determined by the characteristics of the water management system established and later by strictly defensive measures. Such actions create an overconfidence that, without doubt, favors the increase of the productive area and occupied homes, that is, there is an increase in exposure.

Occasionally these thresholds are crossed by extraordinary floods demonstrate the responsiveness of the system. The lives and economic losses that this entails, led to the popular reaction and society feels an urgent need to expand to the maximum threshold set by the last flood. This peculiar attitude starts a process in which the population seeks to mitigate risk through the massive use of public works.

II. RESPECT AND CAUTION TOWARD THE RISK OF FLOODING AT THE BEGINNING OF THE OCCUPATION OF THE TERRITORY ANALYZED

The first attempts of defense against flooding in the southern region of Murcia is characterized, in general, as the practice of a limited set of precautionary measures to try to avoid or mitigate the danger that incorporates the flood.

As the inhabitants of the valley and then the coastal area, they gained a greater ability to transform their environment, they soon found themselves in the flooding of the wadi and its tributaries Guadalentín a resource that could be exploited by using simple farming techniques. Until then, extraordinary flood flows flowed freely, dragging crops, cropping lives and, ultimately, ruining the area each time they occurred. From the point view of flood risk analysis, the features of the natural phenomenon mentioned at this time, consideration is particularly complex as such, due to the profound overlap between the conditions of the use of water in an area where it is scarce and the degree that this use increases, sometimes dramatically, the possibility of events with catastrophic outcome. Achieving benefits therefore seems not net more than the occasional possibility of crisis, especially as the intensities of these are not, much less homogeneous and frequently are shown as those more easily tolerated in their ability to damage .

Over time, population growth and the consequent occupation of new spaces, mostly for agricultural use, resulted in an increase in areas affected by flood risk. This was evident with each major flood, which together with technological advances and the construction of the first large dam on the mainland was to Tibi, aroused the need to project intervention strategies to mitigate structural violent flood waves driving the Guadalentín. However, long periods without rainfall, ie drought, was also added another major concern that difficult socio-economic development discussed in this space. Consequently, the implementation of such measures will be largely influenced by the need to accumulate and exploit water resources to overcome the drought periods.

In this sense, the failure in the canal construction projects, Canal de Murcia, Archivel-Canal to provide water needed land Guadalentín Valley in times of drought, again reinforced the idea of building a dam in the narrow Bridges. Finally, the notorious flood of Santa Teresa of October 15, 1879 will be the truly mark the starting point in the strategy to solve the flooding problems. This disaster and a back that occurred in 1884, which also caused damage across the region, led to the conclusion at Murcia's "flood Congress of the Region de Levante" March 1885 and the first draft global defense works Segura basin in the following year entitled "Works Project Flood Defence in the Valle del Segura" (GARCIA, R. AND GAZTELU, L., 1886).

Despite the significant effort made to carry out a project of this magnitude, the deterioration sequential structural measures constructed and the consequent loss of defensive potential, was particularly evident following the 1973 flood. The catastrophe that occurred that year shows the functionality of the security system and the urgent need for a rethinking of the defensive scheme of the basin, which led to the drafting of a second flood plan in 1977 by engineer Jose Bautista Martin. This document and paying special attention to the strictly defensive infrastructure. The author followed the same guidelines of the 1886 plan, however, distinguished city defense and defense of vegas.

Overall fashioned a defense system that reduces the flow rate during the avenues for no more than 250 m³/sec at the confluence with Segura. However, the sense of security induced by widespread implementation of public works, has the result that the threshold to perform these actions, is disfigured by recent anthropogenic change. Among them, the increase in urban settlement processes on the valley Guadalentín (PÉREZ MORALES, A. 2008).

III. PERFORMANCES IN WADIS AND COASTAL TRIBUTARIES GUADALENTÍN

The expansion of the occupied territories of both the valley, like coastal basin in the last thirty years has been one of the largest and fastest of which are recorded in the Region of Murcia. In just two decades, the coastal municipalities of the sector have been analyzed to double the number of its inhabitants and even have up to eight times that of their homes. Unfortunately, this growth has not followed a consistent line management and in many cases, the beds of gullies and ravines are integrated tightly in the urban fabric, encouraging the emergence of the risk of flooding. The effects of the floods of October 19, 1973 in the case of Puerto Lumbreras or the September 7 and October 14, 1989 for space and aquiline Mazarrón were showing these bottlenecks, which led to the construction of new actions that were incorporated into the defensive system that focused on: Nogalte Rambla, Ramblas and ravines of northern and southern flank of the valley of coastal Ramblas, coast basins between Mazarrón and Aguilas.

IV. NEW ACTIONS AND LEVEL OF DEVELOPMENT

The recent and intense occupation of new areas has resulted in little spaces prepared for these events and, therefore, very vulnerable. The new management plan of the Segura basin covers this situation and believes that these weaknesses must be covered. To achieve this end, presents a matched set of structural and preventive measures as they did a century before the first precursors Defense Plan Basin.

Currently neither of the first has even been started, however, the preventive included in this planning if they have some degree of compliance, these are:

— Contingency plans for Civil Protection and Emergency Planning dam break. By agreement of the Council of Ministers of December 9, 1994, adopted the Basic Guideline of Civil Protection Planning before the Flood Hazard (BOE, February 14, 1995). This document includes, alongside measures to manage the flood emergency, the information which must be observed Autonomous Emergency Plans for the development of risk analysis. The aim is the classification of flood-prone areas and risk-based estimation, as far as possible, conditions and damage that may arise from the occurrence of floods in the territory of planning, with the aim of envisage various scenarios for intervention strategies in cases of emergency. Recently, the Governing Council of the Region of Murcia approved the Special Plan against Flood Risk named INUNMUR.

— Definition and management of flood areas. Hydrological Plan of the Segura basin palliate July 1997 actions on civil protection and land use and urban planning. According to the provisions of Article 11.2 of the revised Water Law (approved by Royal Legislative Decree 1 / 2001 of 20 July), the definition of Public Water falls on the basin organizations.

The work of these organizations have focused primarily on major rivers. Since 1999, the Ministry of Environment complements these tasks through the project LINDE, whose purpose was the same, but the scope is focused on secondary courses. The final impulse was given to the delineation of flood zones arises from the adoption of Directive 2007/60/EC of the European Parliament and Council of 23 October 2007 on the assessment and risk management flood. The above document states that the transposition into Spanish law it must be made before November 26, 2009. In advance, the Ministry of the Environment and Rural and Marine Affairs has promoted the realization of the National Flood Zones Mapping aimed marking complies with this directive and in turn provides information to be considered by the competent authorities planning.

- Development of management system in real time. In this regard took place an important work in developing the Automatic Hydrological Information System (AHIS) that was successfully implemented throughout the Segura basin.

V. CONCLUSIONS

As noted, all infrastructure works developed in recent years and projected for the future are extremely important technical and economic size. It should, however, emphasized one aspect of the utmost importance, and requires greater efforts than those made so far, and that is the problem of flooding associated with land management and land use.

Experience has shown that supplementing with essential structural measures above, the most effective means of defense against the economic damage of floods is precisely the zoning of flood areas, regulation of uses and the establishment of management measures danger. In these circumstances, all the works mentioned above are completed with a set of non-structural actions and planning, corresponding to the performance criteria in extreme situations, to the Public Water management and flood areas have a crucial contribution in mitigating the effects of floods.

The regional and municipal authorities have always been behind the events, and react only after the consummation of the disaster and subsequent public reaction prompted by the fear of crime. Structural measures are the traditional answer to the problem immediately evident that the floods. However, exposure to risk in most cases is ahead of the safety thresholds set theorists such defensive actions. In this sense, the territory management is built into an effective tool for mitigating flood risk. This is essential a good study of the detailed and thorough physical environment through which land uses are organized harmoniously with environmental constraints that shape the territory. In short, it is essential to recover the balance among these environmental factors and processes of occupation through a coherent plan in which flood hazards are considered as a limiting factor.