

Flood Plains

Where the river always reclaims its property

The river bursting its banks last October 12 and the heavy rains during that month caused various floods in Xàbia affecting particularly the Arenal, as well as several homes in the agricultural area of the Pla and basements and garages around the canal de la Fontana. The damage caused in this floodplain make us reflect on a simple fact of nature: that rivers, from time to time, eventually reclaim what is theirs.



In olden times, human settlements were some distance from the flood plains. But as the frequency of flooding lessened, the fertile land created by deposits of sediment from floods became a strong attraction for agricultural exploitation. With the passage of time, urban pressure was another factor that contributed to building in areas with a high-risk of flooding. It is also easier to build on flat land and clay.

The Comunidad Valenciana has a high risk of flooding

In general, the Comunidad Valencia is one of the worst affected by floods. Of the 2,438 floods recorded in Spain in the past 500 years, 413 of them occurred within the confines of this region.

But in addition, the damages suffered are often very substantial due to the low frequency of floods and great intensity of rainfall when they do occur, as well as high population density which has grown exponentially in recent years because of urban overcrowding. If we add to this the increased risk of extreme climatic events as a result of climate change, and thus of torrential rainfall, it seems clear that we must take seriously the risk of our land being flooded, if we do not want yet more regrettable loss of property, let alone loss of life.

It is for this reason that the Law on Land Use Planning in the Comunidad Valenciana (1989) envisioned the "Plan de Acción Territorial de Carácter Sectorial sobre Prevención del Riesgo de Inundación" (Sectorial Regional Action Plan on the Prevention of Flood Risk in the Comunidad Valenciana) (PATRICOVA) as one of the tools of land use planning. Through this a survey of all the flood-prone areas of the region was carried out, according to risks of frequency and depth of flooding. Then a set of remedial measures and their estimated cost was proposed.

In 1997 the Ministry of Public Works, Town Planning and Transportation published the Regional map of Flood Risk, which serves as the basis for developing the action plan proposed by PATRICOVA, approved in January 2003.

PATRICOVA recommends channelling the Gorgos and the location of dikes

In the specific case of the river Gorgos, PATRICOVA proposes two sets of measures. On the one hand, inland, the construction of four dikes that would serve to reduce peak flows and materials swept downstream. In Xàbia, it is recommended to canalise the mouth of the natural water course (camí and canal de la Fontana) to allow drainage into the sea, as well as to prolong the canalisation of the river

mouth upstream to a distance of 2.000m. In other words, strengthening the margins of the Gorgos and Fontana with containing walls on both sides.

At present, channelling has only has been done for a stretch of about 200m, next to the bridge of the Avenida Augusta in front of IES No 1. However, above all it was essential to protect this public building as well as the newly urbanized zone on the other side of the channel. Both are situated in areas of the greatest potential risk of flooding: a frequency of less than every 25 years with a depth greater than 0.8m. Data from other European countries and the United States suggests that building in areas at risk of flooding more frequently than every 100 years is prohibited. This is not to say that overspill or floodwaters occur only once every century, but that each year there is a 1% chance that such an event occurs.

Floodplains change with water and concrete

However, in view of what happened during the flood last October 12 when the river broke its banks above the cement factory, even without carrying out the measures recommended, the canalisation of the final 2 km of the Gorgos would have done little except to fill a little more concrete into our landscape.

But possibly PATRICOVA was not wrong in their estimates, because if we compare the map of the risk of flooding occurring at depths of more than 0.8 m every 100 to 500 years with the actual extent of the river during the flood (estimated after a visual survey of the area conducted the next day), we see that it coincides almost entirely.

So what has happened?

As it turns out, both the the floodplain and the river have changed. In semi-arid regions, it is quite a common phenomenon for powerful flooding to cause the widening of a river channel and the destruction of part of a floodplain because arid land is eroded easily and is swept from one place to another, reshaping the landscape. Furthermore it should be remembered that in the Marina Alta it is quite normal to suffer episodes of torrential rains, especially in the autumn when the temperature difference between the sea and the air is increased. This causes large amounts of evaporation, and if there are layers of cold air in the atmosphere, it produces the phenomenon commonly known as the "gota fria" (cold drop), the effect of which is further exacerbated by the static nature of the clouds, impeded by a mountain range which is almost perpendicular to the weather fronts coming in from the Mediterranean.

During the flood on the 12th of October, the Gorgos was fuelled both by the innumerable gorges that feed it, and a land increasingly filled with asphalt and concrete, over which water glides easily. ...a land which is increasingly devoid of vegetation... vegetation which normally contributes to the absorption of water and prevents erosion. After passing through the narrow, steep and rocky river bed of the village to which it gave its name (Gata de Gorgos), it arrived in Xàbia so strongly and with so much water, that it consumed the bends, widening and straightening the channel. Once unchecked, the river overflowed its banks above the cement plant, over-ran the Benitatxell road and was dissipated by spreading over the flood plain which had formerly helped to shape a fertile valley. A plain that has changed substantially in recent years thanks to the hand of man and concrete.

Seeing the effects of the burst river as well as the recent heavy rain falls, anyone can appreciate that there has been a tilt in the balance of the areas most prone to flooding. The clearest and most blatant example is the "lake" Tamarits and adjacent streets, which were previously next to a marsh and are now

part of it. The same applies to the top of the Avenida Augusta, which has been spared the effects of flood water. And this is because new housing developments have lifted up the the land, so that water which accumulated there before, now travels to nearby areas.

What law allows that some benefit by changing the morphology of the land, while causing injury to others who, as in this case, are suddenly immersed in a lake? It does not seem fair.

Solutions to mitigate floods

Basically, there are four methods to mitigate the effects of, or prevent floods: increase the size of the riverbed; build walls channelling the river and prevent overflow; create a channel to serve as a spillway from the main channel; and create reservoirs that store water, so that it can later be released in a controlled manner. This is achieved with dikes and dams upstream, and lakes in the flood plains.

If we analyse the river flood situation, it is evident that the channelling of the last stretch of the river served to protect the final kilometer of the river bed, and that it was the natural spillway, the Canal de la Fontana, which overflowed and caused much of the damage . On the other hand, the overflow in the area of Catarrojes, served to relieve the water pressure, by increasing the river breadth. Although it affected houses located in Pla, it spared many others located below the disaster.

One wonders if PATRICOVA's proposal to channel the last two kilometers would have been a good idea.

The fourth method is to alleviate floods via water retention and its controlled release. In the Gorgos this is achieved with a series of dykes, but in the event of torrential flows these are insufficient. The system of dams or dikes often results in a cure, but become the disease when they spill over.

The other way of storing water is lakes. A few years ago, a developer proposed to solve the "problem of Saladar" with the creation of a lake to collect water from the gullies that flow into the wetland. The water is then evacuated via the Arenal by a system of flood-gates and a pump (and we assume maintained by public funds). In this case, standard storm drains would be insufficient, since there is a risk of sea water entry during a storm, and in case of a flood, water would exit with difficulty without the help of pumps. But to make sure the system of de-watering functioned optimally, the lake would have to be above sea level. But this would require elevating the ground. Although when ground levels vary, the water from the gullies would no longer end up in the lake, but in the adjacent land areas, inundating the neighbours. To avoid this, all small channels that de-water into the above-mentioned lake would have to be canalised... The solution is complicated in an urbanized area with levels below sea level, which has the risk that the water arrives in the form of precipitation, as well as from the river and from the sea.

Ultimately, flood plains are so called because they are likely to be flooded. However the exact flooding of an area can vary over the years and the centuries, depending on the sedimentation that is deposited or withdrawn, the change the morphology of the plain or the river, as well as the action of man who exploits the fertile and flat valley to build houses.

All of the Pla de Xàbia, and the Arenal is a flood plain. If there is a real concern for people and their property, the government should never allow urban development in areas at risk of being flooded at frequencies less than 100 years or more. Luckily for Xàbia, and although late for some, the Town Hall appears to have taken things seriously after the flood, and has decided to conduct a full technical study of

flooding around the town. This will be conducted by the company IDOM, which is managing consultant for the new General Plan (PGOU). This was announced by the mayor, Eduardo Monfort, who has showed his disposition to not allow building where there is a risk of causing floods.

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[Ver artículo original \(180 lecturas\)](#)