THE EBRO DELTA: CHRONICLE OF A DEATH FORETOLD?

Buda could be the first island in Europe to disappear from the map

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FOTO: European Union, Copernicus Sentinel-2.

The second largest estuary in Europe is in an unprecedented situation of danger. Climate change and the lack of sediments, the result of human intervention, are causing it to retreat like never before. The solution also confronts economic sectors with interests that go against the measures necessary to save it. Meanwhile, the sea continues to swallow it day after day. If we do not act quickly, the island of Buda, located in the far northeast, could be the first to have the first climate refugees on the continent.

Three kilometers from the last sandbar, now in the middle of the sea, lies the sunken Buda Lighthouse. Built in 1864 in Birmingham, it was over 53 meters high. It was the tallest metal lighthouse in the world, 10

meters taller than the previous record holder (located in Florida, United States). Almost 100 years later, in 1961, a storm knocked it down. Apart from being a memorable story, this tells us about a very worrying fact. The Delta has lost more than 3,000 meters of width since then. And the situation does not seem to be improving in the short term.

A year on the island of Buda

The fourth letter of the Greek alphabet, *D* , is known as *delta* . "Herodotus thought of it when he contemplated the arched triangle that formed the mouth of the Nile. In addition to thinking it, he wrote it, *D* ; and, without knowing it, he bequeathed its image and name to posterity." These lines belong to the first pages of *Delta* (Ara Llibres, 2023), a book that is the result of, probably, the most exhaustive research that has been done on the ground so far. The author, Gabi Martínez, lived for an entire year on the island of Buda. The conclusion that the reader reaches is that there is still a glimmer of hope in the conservation of natural spaces in the short term, but that nature's response to human action will ultimately be impossible to combat.

A clear example of this change is, precisely, the island of Buda. Just a few years ago, five and a half to be precise, the beach extended 150 meters further than what we see today. Storm Gloria made it retreat in just a few hours. 3,200 hectares of rice fields devastated by the violence of the sea. It will be, as Gabi Martínez explains, "the first island with climate refugees in all of Europe". But it is not only about the island, but also about a good part of the Delta. In the meantime, its future remains unknown. The Generalitat de Catalunya and the Spanish Government continue to ponder what would be the most urgent way to save it without, so far, any large-scale action plan with tangible results having been deployed.

Guillermo Borés is one of the owners of the island of Buda. His great-grandfather bought it over a century ago, and he now manages it together with other brothers and relatives. His main businesses in Buda are rice farming and rural tourism. "If we don't act quickly, we will be left without an island, without a Delta and without anything." His temperament, sometimes irascible, is a reflection of the stress that the second largest delta in Europe is being subjected to. "Before, the Trabucador beach was 800 meters wide; now it's not even 75."

Borés is a firm supporter of the Dutch solution, which consists of using marine dredgers (ships capable of moving large quantities of sand, a kind of aquatic excavators) that take sand from the seabed and place it back on the beach. "It's what they've been doing for many years in the Netherlands. It's the fastest, most viable and cheapest solution." When asked why it's not being implemented, the answers always go in the same direction. "There are very strong political interests behind it. What they want is to pocket the public money that would fall to them if the transfer of sediments from the reservoirs is finally approved."

Lack of sediment

The sedimentary route is the solution that most scientific sources that have conducted studies on the preservation of the area agree on. The Delta has stopped gaining ground in the sea, they argue, because it has stopped dragging a large amount of sediment in recent years. Of the thirty million cubic meters it originally transported, only 159,000 now remain. Just as it sounds. The reason, they explain, lies in the construction of artificial reservoirs, which attract a large part of these sediments. In this way, the material that previously reached the Mediterranean and served to widen the land surface in the water is no longer there. The solution, then, would be to make everything go back to how it was before.

The main problem is that it is not easy at all. "We are looking, through many studies, at how it could be done. It is not just a matter of opening the floodgates. You need a certain flow, that is, a sufficient force to drag them to the sea", emphasizes Carles Alcaraz, researcher of marine and continental waters at the Institute

of Food Research and Technologies. As he explains during the interview for the report, it is a solution that is not simple, but it would be the only reliable one in the long term. "We can build retaining walls on the coast, if we want. This will certainly take a few years. But the definitive solution must be to make the river drag everything that has been used to build the Delta up to now back."

Humanity has exploited the world's river deltas for thousands of years. Until recently, this coexistence had not presented serious problems. Today, however, the scenario is completely different: from the subsidence of the soil due to the construction of buildings (with the case of Venice as the greatest exponent) to the disappearance due to dams that cause sediment retention (this also happens in the Nile, in this case due to the effects of the Aswan Dam), through to the rise in sea levels caused by the climate crisis.

The big hidden interests

"The reason why the floodgates of the reservoirs are not opened during the river floods to be able to expand the Ebro delta is in the interests of large hydroelectric companies like Endesa." Josep Juan Segarra is the president of the Sediment Association. For years they have been denouncing the abuses of these companies and demanding that the sediment solution be applied urgently to combat the situation.

Sediment diversions, he explains, would also be another possible solution. This has already been done in the Llobregat, with the bypasses of mining brines, using pipes to move these sediments downstream. The price, according to Segarra, would be much cheaper than using marine dredgers or the Dutch solution. "According to a study by the Polytechnic University of Catalonia, the cost of emptying reservoirs would be only 0.50 euros per cubic meter of sediment. Using dredgers, on the other hand, could skyrocket to 4 euros. Transporting sand by truck, one of the few actions that are being taken right now, is even more expensive."

The island of Buda is perhaps the clearest example of the delicate situation of the Ebro delta, but not the only one. A good example is this map from the Cartographic and Geological Institute of Catalonia with three lines representing the regression scenarios and the estimated position of the Riumar coastline for the years 2050 (red) and 2100 (yellow, moderate scenario; purple, severe scenario). Photo: Cartographic and Geological Institute of Catalonia. Maritime Museum of Catalonia.

The three rescue plans

Currently, there are three plans in relation to the conservation of the area. The Delta Plan, proposed by the Consensus Table (made up of town councils and representatives of the irrigation community), the Delta Strategy, of the Generalitat, and the State Protection Plan. The president of the Sediment Association states that, of all three, the only thing that is being implemented is moving sand from one beach to another. “It is useless, because everything that is transported from one place to another ends up being replaced by the sea in a short time,” explains the president of this association, Josep Juan Segarra.

Segarra points directly at the interests of these large hydroelectric companies that, he assures, are generating tens of millions of euros annually with the reservoirs in the final stretch of the river alone. “However, when it comes to environmental costs and responsible management of sediments, neither the Spanish nor the Catalan Government demands anything from them.” This happens, he continues, because the administrations pay more attention to businessmen, hunters and property owners than to experts in

coastal dynamics. “Without scientific and courageous management of sediments, the Delta is doomed to disappear, with the serious economic, ecological and social impacts that this will entail,” he states.

The position of Borés and his family is, some say, clearly influenced by the economic interest of keeping his business afloat. The farmer and businessman from Buda Island sells his rice in packages (under the trademark Arròs de l’illa de Buda) that, on the back, tell the story of the emergency that his rice fields are experiencing. “Nobody listens to me because I’m just a farmer. But the day there’s nothing left, everyone will regret not having acted in time.” Perhaps his histrionic urgency could make some think that his speech is clearly biased; that the solutions of marine dredgers are, in effect, a short-term patch that will not solve the very serious ecological crisis that the mouth is experiencing. What is clear, however, is that the beaches are increasingly narrower, that the rice fields see the sea ever closer and that the effects of another storm with characteristics similar to Gloria could end up killing some of the most exposed parts of the Delta.

Whatever the solution, without urgent, clear and coordinated action from all parties, we will hardly be able to preserve this UNESCO biosphere reserve, unique in Europe. “We are living the consequences of our actions and it is clear that we will see a clear decline in the Delta,” Gabi Martínez answers when asked how she sees her future after living there for almost a year. “The feeling, after all this time, is that there is the possibility of holding on. How far? No one knows. Buda Island is a symbol of everything we are losing. I don’t know if it is everything, but at least it is a lot.”

Aerial view of the mouth of the Ebro Delta, with Riumar in the center of the image. Photo: request credit Gemma/Discover)

INTERVIEW

Agustín Sánchez-Arcilla, professor of the Department of Hydraulic, Maritime and Environmental Engineering at the Polytechnic University of Catalonia (UPC) .

Agustín Sánchez-Arcilla. Photo: UPC.

Why is the Ebro delta receding?

Because the river contributes much less sediment than before, while marine factors remain more or less the same.

What solutions do you propose?

At the UPC we are participating in a European project, the only coastal one within the Green Deal, studying two paths. One is to increase the transport of sediments downstream with controlled floods. The other is to make contributions to the coast inspired by nature, such as reconstructing dune systems that existed at the beginning of the 20th century.

Could the Dutch model be useful?

Not directly. On the Catalan coast we have much less sand and a very different wave pattern than in the Netherlands. Therefore, applying your model here would not be efficient.

Is it urgent to act?

Absolutely. Vulnerable areas like the Trabucador bar, which is naturally dynamic, could disappear if we don't increase the sediments that reach it. We need to continue with pilot tests to avoid future climate refugees.