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*Landscape transformations caused by the development of industrial activity in the Avilés and Aboño estuaries. The case study of the municipalities of Gozón and Carreño (Mancomunidad Cabo Peñas)*

**O**ur study spotlight on the changes in the landscape introduced by the industry around the estuaries of Avilés and Aboño; specifically, it focuses on the analysis of what happened in the municipalities of Gozón and Carreño that constitute the Mancomunidad of Cabo Peñas.

Until the appearance of the large industrial complexes around the estuaries, both municipalities maintained an agrarian structure with features characteristic of the agrarian landscapes of Cantabrian Spain, highlighting the mining operations of Llumeres and Regueral. The only outstanding secondary activity was the shipyards in Avilés and those located in the seaside villages of Luanco and Candás, along with the canning industry of the area.

It was not until the development stage that the steel industry shifted to the coastal areas near the cities of Avilés and Gijón, which became a focus of attraction for all kinds of companies. The estuaries became points of interest and this was reflected in the transformation of the landscape of these natural areas.

The aim of this work is to analyse the changes in the rural and natural landscape of the municipalities in the vicinity of the estuaries (Avilés and Aboño) due to the installation of the industrial complexes of Ensidesa, Endasa, the Tudela Veguín cement plant and the Aboño thermal power plant. It is considered appropriate to undertake this study although there are numerous studies on the Avilés estuary, there are hardly any others, that analyse in detail the evolution of the landscape transformations that have occurred in the municipality of Gozón due to the industrial development of the Avilés estuary

and the same applies to the opposite axis, the Aboño estuary, at the eastern end of the Cabo Peñas projection, and its relationship with the landscape changes that have occurred in Carreño.

For this study, we have made use of the information obtained in the historical archives of the councils of Gozón and Carreño regarding the classified industry files, the regulations and the planning instruments that regulated and currently regulate these spaces. On the other hand, for the analysis of the landscape we have used the available aerial photography and for the most recent parts we also have used the orthophotos of the PNOA and the fieldwork in the study area. We have used Corel, a graphic design software, for image montage and highlighting those elements in the images that help to explain the cases analysed.

In the municipalities of Gozón and Carreño the natural landscape is practically non-existent, there are only reduced formations of oak and chestnut trees, on the contrary, we can see abundant allochthonous species, such as pines and eucalyptus trees introduced through reforestation since the middle of the 20th century. There are also large extensions of natural meadows, being the most predominant formation. On the coastal strip there are heathland formations and dune systems with the characteristic vegetation of this environment.

For a long time, the regulatory and instrumental framework did not help to offset economic interests and licenses were granted for the construction of industrial complexes in spite of the destruction of unspoiled natural areas.

On the right bank of the Avilés estuary, the changes began in 1946 with the establishment of the aluminium company Endasa in the Laviana area, in the municipality of Gozón. On the land acquired between the Estrellín and Barquería hills, several works were carried out, one of them consisting of filling in an area of marshland to gain land from the sea and the rest was cleared for urbanisation. As the factory needed more space to improve its facilities, the Estrellín marshes were drained to build a dock for the factory and the Llodero and Zeluán marshes were filled in. The dune fields that crossed them were altered due to the breakage of a pipe in 1963, creating two artificial ponds in the Llodero inlet, which with the various alterations that the terrain suffered in the following decades only the Zeluán pond that we can see today remained.

On the other hand, the Ensidesa factory, which meant a great change in the landscape of Avilés, also contributed to the transformation of the landscape in Gozón. In Cardo's area, in 1955 hydraulic works were conducted for the installation of an industrial reservoir. The Granda reservoir was colonised over time by vegetation and wildlife and has become one of the most important freshwater wetlands in Asturias.

The Aboño estuary is located on the border between the municipalities of Carreño and Gijón. Since the mid-twentieth century there have been significant alterations because of its proximity to the port of Musel and the implementation of two large heavy industry complexes.

The Tudela Veguín cement factory occupied the land on the left bank of the estuary, but the main modification it introduced in the natural landscape of the council of Carreño was the exploitation of the Percil quarry for its self-supply. It is located to the west of the factory about 3 km in a straight line in Perlora's area. Its open-pit exploitation began in 1952 and has been expanding its surface area over the decades, increasing its visual impact and

affecting nearby villages. It currently occupies an area of 85.10 ha and the trend is to continue its exploitation until 2047.

The Aboño thermal power plant was built on land on the right bank of the estuary. This factory developed its growth in distinct phases. The first phase was inaugurated in 1974 and the second in 1985. The main transformations included the canalisation of the Aboño River and the alteration of the marshes in the southern area.

At the same time, in the seventies, another major project was developed in the area of the estuary, the Parque de Carbones (Coal Park). The land chosen was the only one available at the mouth of the estuary. In the nineties, new works were undertaken in this area to extend it to the entrance of the estuary, destroying the beach and creating a strong visual impact with a rock wall that was raised to protect it from the sea.

It is obvious that the changes that occurred in the landscape around the estuaries are related to the socio-economic situation of the area. In both Gozón and Carreño, sites of significant ecological value were destroyed and the natural ecosystem of the estuaries was modified (marshes and beaches were destroyed, rivers were canalised), despite the fact, in some areas such as the estuary of Avilés and its surroundings, it is possible to find protected landscapes that are part of the European Natura 2000, like the Llodero inlet, the Zeluán pond and the Granda reservoir. Although their origin was artificial, new ecosystems were created and managed to thrive amidst the destruction and modifications introduced by the industry.

All in all, industrial activities often arouse debates with opposing positions between the staunch defenders of industrial activities as an economic engine and those who plead for the preservation of the natural environment. However, it is not easy to implement recovery measures that satisfy all parties involved.