

Comprehensive Analysis of Territorial Uses for the Development of Mining Degraded Areas: The Surrounding of Portmán (La Unión)

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1. INTRODUCTION

The Portmán Bay, Southeast Iberian Peninsula, is home to one of the largest environmental disasters on the Mediterranean coast: the silting of the Portmán Bay and the most of the continental shelf facing this bay, caused by the dumping of more than 60 million tonnes of mining waste to the sea, over more than thirty years (Banos-González and Baños Páez, 2013).

The treating site from Peñarroya Company used sea water for the concentration of the ore through a differential flotation process, reaching a processing capacity up to 10,000 t día⁻¹. The wastes of the process, called “estériles”, were dumped into the Mediterranean Sea over the operation period, from 1957 to 1990. Almost 60 million tons of wastes completely filled the Portman Bay and the continental platform from



several kilometers of radius (Benedicto et al., 2013). After the cessation of discharges, more than 80% of the bay of Portmán is closed; it means, around 75 ha. which had previously been occupied by the sea (Benedicto et al., 2008). The footprint in the landscape of the Sierra Minera (Mining Range) extends in about 40 km².

In 2011, the favourable Environmental Impact Statement was announced of the Project to recover and environmental suitability of the Portmán Bay, promoted by the Ministry of the Environment (BOE, 2011), which included the dredging of the bay to bring the breakwater line closer to 250 m. to the coast line of 1957. The expectations regarding the aforementioned project, which had the consensus of both the administrations involved and all the neighborhood groups and ecologists were very high. Nevertheless, the project was paralysed from 2013. Currently, new actions are planning for the development of the surroundings of Portmán, without certainty in the completion of these actions.

From a socio-economic point of view, the recovery of the bay may be the beginning of a change on the course in the traditional approaches of tourist development of coastal areas. This opportunity should bring an alternative model for improving the environment, since tourism can be used as an instrument for the construction of new spaces of territorial growth (Benseny, 2006).

The aim of this work is the identification and categorization of a set of factors related to the potential activities associated with the recovery of the bay and to the different plans for the development of Portmán and the Sierra Minera. In addition, it is intended to integrate these factors in order to define the most favorable and feasible scenarios for planning a sustainable local development and respectful with the environment.

2. METODOLOGY

2.1. STUDY AREA

The study area is located in Portmán bay (SE of the Iberian Peninsula). The bay is included in the Sierra Minera de Cartagena - La Unión, constituting the southeastern end of the Baetica mountain range.

2.2. METHODOLOGICAL APPROACH

A set of detailed partial analyses of all the territorial, environmental and patrimonial constraints and limiting factors, which could be derived from the different regulations, legal obligations and land management were carried out. As limiting factors, those related to legal or management protection, which are not compatible with any urban development, were considered. On the other hand, those areas where the possible



development is strongly dependent on the prior elimination of mining risk and soil contamination, as well as on the maintenance of the natural values of the environment, were considered as main constraints. Whereas the additional constraints corresponded to the set of elements that, without being included in the previous categories, mean a recognition of the value of the territory, mainly in terms of its archaeological and natural heritage, due to its connection to three areas of the Natura 2000 network.

The integration and spatial analysis of all the limiting factors and constraints was performed by a geographic information system (GIS), which allowed the assessment and the quantification of the different constraints.

A second phase of the analysis consisted of an overall assessment of land uses to determine the opportunities for the development of the surroundings of Portmán, following a spatial hierarchy. The first level was established from the area occupied by limiting factors. Then, in the remaining area, the main constraints were incorporated. Finally, where no limitations or main constraints were found, the area subject to the additional constraints was shown.

3. RESULTS

The partial analyses were carried out grouping the territorial elements in four major categories: Geomorphology, Territorial and Urban Planning, Natural Environment and Cultural Heritage.

These partial analyses provide an overall vision of the study area, which allow the assessment of territorial categories in relation to possible developments such as residential and tourism projects.

From the results of the integration of the each aforementioned categories, it may be concluded that the net area under any limiting factor and main constraints, represents 94.6% of the study area. When additional constraints are included, the proportion of the area would reach 95.6% (Table 1).

Table 1. Study area under any limiting and constraints factors.

TERRITORIAL LIMITING AND CONSTRAINTS FACTOR FOR URBAN DEVELOPMENT	NET AREA (Ha)
Incompatible area	566,33
Heavily constrained area	322,84
Constrained area	6,74
Net area	895,91

These results show the complexity and the existence of serious restrictions for the potential urban development of the surrounding of Portmán, due to its current configuration as a result of its mining history and the unique environmental values.



It reinforces the idea of trying to address a sustainable development that favours the preservation of the natural values of both the biotic, flora and fauna, and abiotic, geological-mineral, archeological and industrial, heritage and associated landscapes. This sort of development would allow the conformation of a singular space, located in the western part of the Regional Park of Calblanque, Monte de Las Cenizas and Peña del Águila, in the vicinity of the tourist zones of the south of the Mar Menor lagoon, offering a complementary alternative to that Sun and beach tourism, which predominates, almost exclusively, in the Region of Murcia.

In this sense, it is precisely the location of Portmán what strengthens a proposal to enhance its natural and historical values. The southern slopes of the Mar Menor and La Manga offer conventional tourism, based on the concentration of residential complexes. Nevertheless, the mining and fishing singularity coupled with the natural values of the surroundings of Portmán allow a complementary and scarce supply in the regional context, based on tourism with a cultural root. The tourist potential of this supply is already evident within more than 25,000 visitors of the Mining Landscape of La Union and Cartagena in 2010. This would justify the integration of Portmán, to form a Large Regional Mining Park, aimed at socio-economic growth of quality, implying the social fabric of this area in its design and development.

4. CONCLUSIONS

The results of this work show that the net area under any limiting factor and main constraints, represents 94.6% of the study area, reaching 95.6% when additional constraints are included in the analyses. Therefore, due to the complexity and the existence of serious limitations for the urban development of the study area, it is made necessary to orient Portman's development, preferably towards the enhancement of its environmental, mining and fishing identity, rather than through a process of transformation towards a conventional tourist model.

Moreover, the spatial integration of limiting factors, main constraints and additional constraints applied in this case study has proven to be an adequate tool for any spatial planning and decision making process, and that could be incorporated into other planning studies of the land uses.

