

HYDRIC INDICATORS OF SUSTAINABILITY AND TOURIST AND RESIDENTIAL DEVELOPMENT AT THE COSTA BLANCA (ALICANTE)

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I. OBJECTIVES AND METHOD

The need to relate the concept of sustainable development to water resources both quantitatively and qualitatively means that this study has the following objectives: 1) analysing the economic growth explanatory factors that contribute the most to identify the Costa Blanca as the area with the highest tourist and residential reception level, with modest income and quality holidays, for Spaniards as well as for citizens coming from the rest of the European Union; 2) focusing the analysis of sustainability on the water resource, in quantity and quality, and on the pressure exerted upon the natural systems and the responses offered by the society. The idea is to acquire knowledge so that we can act before potential economic and environmental conflicts; 3) evaluating the role of investments when it comes to find a balance between economic growth, environmental preservation and ethics as the challenges of tourist planning and management; 4) the shortage of renewable water resources in the tourist and residential territories, makes it necessary to implement an adaptive, integrated water management scheme. The intention is to reduce the pressure on water demand and succeed in guaranteeing the supply, in terms of quantity as well as quality, in competition with other productive uses.

The methodological approach is based on the use of hydric indicators that can statistically measure a significant aspect of sustainable development; in other words, a useful tool to compare situations in different municipalities and during different time periods. These indicators show the pressure that human actions exert on the water resource and its state-quality, along with the response provided by environmental policies. The objective is to improve the adaptive, integrated management of water in tourist municipalities and their area of influence seeking to reduce the pressure on the autochthonous water resources (hypogea, surface resources and those coming from desalination) as well as on the foreign ones (transfers). In short, an effort is made to find a more practical, convenient way to analyse the tourist development process and its geographical implications.

The information has come from various sources: 1) the *Mancomunidad de los Canales del Taibilla* —The Taibilla River Canals Association [of municipalities]— (an autonomous body which is dependent on the Ministry of the Environment), The *Consortio de Aguas de la Marina Baja* —The Water Consortium of the Marina Baja [region]— as well as local institutions and enterprises which have provided the monthly consumption data corresponding to their municipalities during the period of analysis, i.e. 2000-2005; 2) an interview with the ruling body of the enterprises which distribute the water to the different municipalities: Aquagest, Agamed, etc, and with the different local institutions; 3) a questionnaire filled in completely by the managers responsible for the distribution of water to urban centres; 4) fieldwork to visit the water reservoir facilities and treatment plants and check the type of treatment applied to the regenerated waters, the destination of treated waters and the new exploitation possibilities.

The Costa Blanca is the narrow strip of land of the Alicante province which borders on the Mediterranean Sea. It is the most important tourist and residential centre in the Valencian Autonomous Community and finds itself on a stage of expansion that has been bringing into it permanent residents from 1950 to the present day. The tourist and residential activity developed by the municipalities located along the Costa Blanca and its area of influence (up to 10 kilometres from the coast) has been helped by the favourable climatic conditions, the interest of its inhabitants, the efforts to overcome the existing underdevelopment situation, and by the initiatives undertaken by the Spanish national authorities both to increase the per capita income level and to find a new source income that could offset the deficit in the trade balance.

This new economic orientation entails increasing the provision of water resources for the tourist and leisure sectors in order to guarantee a revaluation of the territory. The territorial economic and social development model shaped is irradiated from the coast to the inland areas, creating labour and economic dependency between these two spaces. It is a process that keeps taking place all over the Costa Blanca and consists in an accelerated growth of the tourism and construction sectors which in turn generates a fast increase of income that can attract a massive flow of immigration leading to a vertiginous demographic growth.

The industrial growth stage assumed the deterioration of the natural environment in order to achieve sustained economic growth. The paradigm of sustainable development, created in the Brundtland report of 1987 and spread through the 1992 Rio de Janeiro summit, integrates economic growth with environmental protection and social equity. This new economic development model appears as an explicit objective of the European Community in the Single Act of 1987, and in the Maastricht Treaty of 1992 imposes the obligation of including environmental issues in all European Community policies. Likewise, a proposal is made to use a series of indicators that can measure sustainable development: Pressure, State and Response (PSR). This is a system that has served as the basis for the creation of a new analytical framework known as the DPSIR (Driving Force-Pressure-State-Impact-Response) model, a new paradigm that incorporates the reasons for the pressure and the impacts resulting from the environmental modifications of the territory.

Sustainable development implies economic growth and quality of life keeping a balance with water resources. The application of this new economic model to the Costa Blanca

has as its aim to influence, encourage and help municipalities to maintain the integrity and diversity of nature as a way to make sure that all uses of the water resource are equitable and ecologically sustainable. For this reason, it seems that the general objective of sustainability in the Costa Blanca must be shaped on the following foundations: 1) ensuring urban supply; 2) guaranteeing the good quality of the water supplied; 3) rationalising water consumption (saving, network performance, etc.); 4) protecting integrated quality through tertiary treatment (which includes the desalination of treated waters); and 5) valuing the contribution made by these new resources generated in the hydric balance of each tourist and residential area and in their appropriate management.

The tourism phenomenon did not assume the problem of shortages until the late 1990s. Neither did it consider the need to save and optimise water resources. Things were different in the rural milieu, where the traditional irrigation system (flooding) was replaced by localised irrigation. Its greater awareness of ‘the water economy’ (it reduces consumption and saves costs) is opposed to the waste that prevails among the tourist population and in recreational uses. This greater consumption within the tourist sector provokes quantitative and qualitative pressures on the water resource (Tables No. 2 and 3). However, the six-year period 2000-2005 witnessed a significant change statistically confirmed by the decrease in the consumption per inhabitant and day—from 189 l/h/d in 2000 to 179 in 2005— among the permanent population, a decrease in the consumption that extended to the seasonal population, which passed from a consumption of 223 l/h/d in 2000 to 214 in 2005. Consequently, the water demand growth model was replaced by another model that is more in keeping with economic competitiveness and respect for the environment.

The state-quality indicators have as their objective to know the quantitative and qualitative conditions of water resources in the different areas of the Costa Blanca. These actions materialise in the environmental dimension (hydric balance), in the economic dimension (income and employment), in the social dimension (quality of life), and finally in the tourist dimension (profitability of the tourist enterprise). The indicators analysed confirm the sustainable character of the whole tourist and residential territory of the Costa Blanca. Water supply is guaranteed by means of the new desalination technology avoiding damage to the environment; income levels improve, quality of life is achieved; and the tourist enterprise becomes profitable and generates employment.

The response indicators fulfil the aim of checking the economic effort (investment expenses) made by the society in order to keep and improve the environmental conditions of the territory. The objective sought is to achieve a sustainable progress that can place the Costa Blanca in a competitive position in Spain, in the Mediterranean Arc, and in the European Union. These local initiatives turn out to be essential in order to generate results which make it possible to reach sustainable development, since water-related problems have a stronger impact locally than globally.

II. CONCLUSIONS

1.- The Costa Blanca is a model of economic, social and environmental sustainability and efficiency, not only in the Valencian Community but also in the Mediterranean Arc and in the European Union. The efficient use of water permits the urban and rural development

of the different tourist areas, guarantees the availability required, in terms of both quantity and quality, to meet the needs of the less privileged population segments, and ensures the adequate protection of surface and groundwater resources.

2.-The change in the territorial model of the Costa Blanca has been helped by the favourable thermal conditions, by the need for its inhabitants to leave behind a situation of poverty and underdevelopment, and by the economic policy driven by the Spanish authorities between 1960 and the present day for the purpose of offsetting the deficit in the trade balance.

3.-The pressure, state and response indicators confirm the existence of a process repeated in the different areas which consists in an accelerated growth of the tourism and construction sectors that in turn generates a quick income growth that can attract a massive flow of immigration leading to a vertiginous increase of the resident and seasonal population, the consumption of water, and the regeneration of the water flows recovered.

4.-The tourist model of Benidorm —hotel-based— and that of Torrevieja-Denia —second-residence-based— show deep internal contrasts between their respective local economies. The town of Benidorm receives 3.6 times as much annual income from the tourist sector than Torrevieja.

5.- The most sustainable and efficient tourist and residential model in the Costa Blanca can be found in the Benidorm municipality: it consumes 12 hm³/year —0.5 % of the total consumption in the Valencian Community—, makes a 2% contribution to the regional GDP, receives 4% of domestic tourism and boasts the most advanced and comparatively advantageous environmental infrastructure, an integrated water resource management scheme that becomes essential to consolidate its urban-tourist model based on sustainable development.

6.- The need to move toward supramunicipal enterprise management formats (such as associations of municipalities and consortia, among others) and the appropriate dimensions which can guarantee the supply as well as the reuse of treated waters for new applications (e.g. agricultural exploitation, golf courses, parks and gardens, washing down of streets, etc), thus increasing availability (the hydric balance is improved) and reducing the pressure on the water resource at the Costa Blanca.