

Causes, consequences and solutions to the problem of floating solid waste in the Segura River and its irrigation channels, in the district of Vega Baja (Alicante, Spain)

R. Abadía⁽¹⁾, M. Brugarolas⁽²⁾, C. Rocamora⁽¹⁾, L. Martínez-Carrasco⁽²⁾, H. Puerto⁽¹⁾, J. Cordero⁽²⁾

⁽¹⁾ *Department of Engineering. University Miguel Hernandez. Carretera de Beniel km 3.2. 03312. Orihuela (Alicante). Spain. + 34 966749675 abadia@umh.es*

⁽²⁾ *Department Agro-Environmental Economics, Cartography Engineering and Graphic Expression in Engineering. University Miguel Hernandez.*

1. Introduction – The region of *Vega Baja del Segura* is located at southeast of Spain, in Alicante province, right at the mouth of the Segura river. The traditional irrigation system that has been developed in this area since Roman times, consists of a complex system of irrigation and drainage channels which take water directly from the river Segura, through small dams located on the river bed, called "azudes", which divert water to irrigation channels called "acequias", which are responsible for distributing water to the fields. The excess irrigation water is collected in drainage channels, called "azarbes", which in turn are used as irrigation channels when they reach a sufficient height over the fields. The whole region is a great alluvial plain of about 23,000 hectares, with a slope of less than 1 per 10000, which makes drainage difficult. In recent years, the floating solid waste that invades the entire water transport system is causing various problems that are difficult to solve. In this work an analysis is made of the type of solid waste that reaches the watercourses [1][2], the problems they generate, as well as the possible solutions.



Figure 1. Drone taking aerial picture of an accumulation waste point

2. Experimental – The analysis of the type of waste has been carried out through aerial photographs taken with a drone in 7 points of accumulation of waste (Figure 1), calibrating these photographs with the manual counting of point extractions of waste. The analysis of the problems and its solutions has been carried out by a focus group discussion and surveys among main actors of the territory.

3. Results and Discussion - The results show that the floating waste is of diverse origin, predominantly vegetable waste from the banks of the river itself, such as reeds, as well as various types of waste from domestic, agricultural and industrial activities, among which plastic waste predominates. These wastes cause economic, landscape, environmental, public health, social and legal problems. Among the solutions, it is worth highlighting the awareness and information to the whole population to prevent waste from continuing to reach the channels, the direct elimination of existing waste, the improvement of coordination between the institutions involved, the implementation of an effective system of sanctions and the improvement of regulations.

4. Conclusions – The problems caused by floating waste have important consequences for the region's economy, from an agronomic, environmental and touristic point of view. The coordination between the different agents and institutions involved is fundamental for a sustainable management of the basin, so that it is kept free of floating solid waste and in good environmental conditions.

5. References

- [1] Gasperi, Johnny, et al. "Assessment of floating plastic debris in surface water along the Seine River." *Environmental pollution* 195 (2014): 163-166.
- [2] Morritt, David, et al. "Plastic in the Thames: a river runs through it." *Marine Pollution Bulletin* 78.1-2 (2014): 196-200.