# Planning policies and infrastructure development: the case of Vila Real Municipality

**Sadia Afrin(1), Cristina Matos(2), Luís Ramos (2), Isabel Bentes(2), Júlia M. Lourenço(1)**

(1) Department of Civil Engineering
University of Minho, sadia@civil.uminho.pt
Phone/fax numbers: 00 351 932814257
(2) Department of Engineering
University of Trás-os-Montes and Alto Douro

This paper identifies the land-use changes in Vila Real municipality, the major urban pole in North-eastern Portugal, for the period of 1990-2006. In addition, it explores the relationship between land-use change and wastewater infrastructure development in this municipality. The study uses satellite data and a Geographical Information System (GIS) to identify the pattern of urban development and identifies that about 822 ha of land have been urbanized in this municipality over those 16 years. The trend of land-use transformation and urbanization in Vila Real municipality exerts pressure on the surrounding farm land and rural areas by converting them into urban areas. The study finds that the main driving force behind this urban expansion is the improved road infrastructure rather than the application of urban and other land development policies. Thus, unplanned and sporadic urbanization has induced urban sprawl in this municipality and created pressure on its existing wastewater infrastructure system. The municipal cost of developing wastewater infrastructure has been increased to serve its dispersed urban clusters, aggravated by the complex natural topography and morphology of the terrain. Finally, the paper provides a set of policy recommendations considering the need for more sustainable trends.

**Keywords:** Land-use; Urban sprawl; Wastewater; Infrastructure Cost