

DEVELOPMENT OF A GIS LOCATION MODEL FOR TREATED WOOD WASTE PROSPECTING THE IMPLEMENTATION OF REMEDIATION PLANT(S) IN PORTUGAL

Helena Gomes^{1*}, Alexandra B. Ribeiro², Vítor Lobo¹

¹ Instituto Superior de Estatística e Gestão de Informação, Universidade Nova de Lisboa, Campus de Campolide, P-1070-124 Lisboa, *E-mail: g2002159@isegi.unl.pt, Tel.: (+351) 213871573, Fax: (+351) 213872140

² Departamento de Ciências e Engenharia do Ambiente, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa

Topic 4: Remediation technologies, recycling and disposal

The future of the wood preservation industry depends on the solution(s) found to manage the treated wood waste problem. The recycling of these wastes can only be made after its remediation, so that planning and optimisation of remediation unit locations is of major importance.

The objective of this study is to develop a GIS (Geographic Information System) based location model for treated wood waste in Portugal. With this model, we obtain and characterize the demand nodes that will be used for the resolution of the p-median* problem. It is the first step of an integrated approach that aims to develop an optimisation model for the location of one or more remediation plant(s) for the treatment of treated wood waste for further recycling, minimizing costs and respecting environmental criteria.

To achieve the location model of treated wood waste, the amount of treated wood waste generated in Portugal was determined, considering the quantities of preserved wood produced, imported and exported, different uses of treated wood and service life estimations according to these uses. The geographic location of these main utilizations of preserved wood was also determined and prioritised according to the importance of that use (percentage of the total preserved wood produced) and the total areas covered. The location of the treated wood waste was also related with the population density.

Further developments of this work include: i) the identification of the key environmental and economic factors to be considered in the optimisation model, ii) the process of formulation and combination of these criteria; iii) analysis and comparison of heuristics in the p-median problem resolution; iv) production of a final map with the visualization of areas suitable for the location of remediation infrastructures.

* The p-median problem is a classic optimisation problem that involves the location of facilities in such a manner that the total weighted distance of all users assigning to their closest facility is minimized.