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Multi-criteria decision analysis for bioenergy in the Centre Region of Portugal

T.C.J. Esteves (1), P. Cabral (2), A.J.D. Ferreira (1), and J.C. Teixeira (3)

(1) Department of Environment, IPC - Escola Superior Agrária de Coimbra, Coimbra, Portugal, (2) ISEGI – Universidade Nova de Lisboa, CEGI, Lisboa, Portugal, (3) Universidade do Minho, Department of Mechanical Engineering, Guimarães, Portugal

With the consumption of fossil fuels, the resources essential to Man's survival are being rapidly contaminated. A sustainable future may be achieved by the use of renewable energies, allowing countries without non-renewable energy resources to guarantee energetic sovereignty. Using bioenergy may mean a steep reduction and/or elimination of the external dependency, enhancing the countries' capital and potentially reducing of the negative effects that outcome from the use of fossil fuels, such as loss of biodiversity, air, water, and soil pollution, ...
This work's main focus is to increase bioenergy use in the centre region of Portugal by allying R&D to facilitate determination of bioenergy availability and distribution throughout the study area.This analysis is essential, given that nowadays this knowledge is still very limited in the study area. Geographic Information Systems (GIS) was the main tool used to asses this study, due to its unseeingly ability to integrate various types of information (such as alphanumerical, statistical, geographical, ...) and various sources of biomass (forest, agricultural, husbandry, municipal and industrial residues, shrublands, used vegetable oil and energy crops) to determine the bioenergy potential of the study area, as well as their spatial distribution. By allying GIS with multi-criteria decision analysis, the initial table-like information of difficult comprehension is transformed into tangible and easy to read results: both intermediate and final results of the created models will facilitate the decision making process.
General results show that the major contributors for the bioenergy potential in the Centre Region of Portugal are forest residues, which are mostly located in the inner region of the study area. However, a more detailed analysis should be made to analyze the viability to use energy crops. As a main conclusion, we can say that, although this region may not use only this type of energy to be completely independent in terms of energy, it will certainly reduce the amount of consumed fossil fuels, leading to a substantial reduction of the importation of this product.