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Identification of Local and Regional Socio-Economic Patterns in Solid Waste Generation Rates

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Abstract

Nowadays, due to the increasing amount of waste generated and the related environmental problems, solid waste management is becoming a key challenge at local, regional and national level. Analysing the relationship between commonly used economic and social indicators and the structure of the waste generated can contribute to more efficient management of waste disposal systems.

In our work we have used both: open data sources for quantitative analysis at national and regional level and direct data from selected waste management facility for detailed analysis at local level. Applying data mining and statistical methods we performed multivariate analyses to identify potential social and economic patterns of linkages between available metrics. In addition, we examined the local and regional distribution of the identified correlations which allowed us for multi-level verification of the observed relationships.

This study compares the significance of selected reporting measures and selects those that are most correlated with solid waste generation rates for different geographical scales. The identified determinants can be effectively used in the process of forecasting waste quantities and handling waste management processes. Performed cluster analysis has identified repeatable patterns in the morphology and size of waste streams across regions that can be used in authorities' decision support systems.

The research was restricted at national level to European countries, at regional level to Polish local administration units and at local level to the selected waste management facility in the eastern part of Poland.

Keywords: municipal solid waste, statistical analysis, data mining