

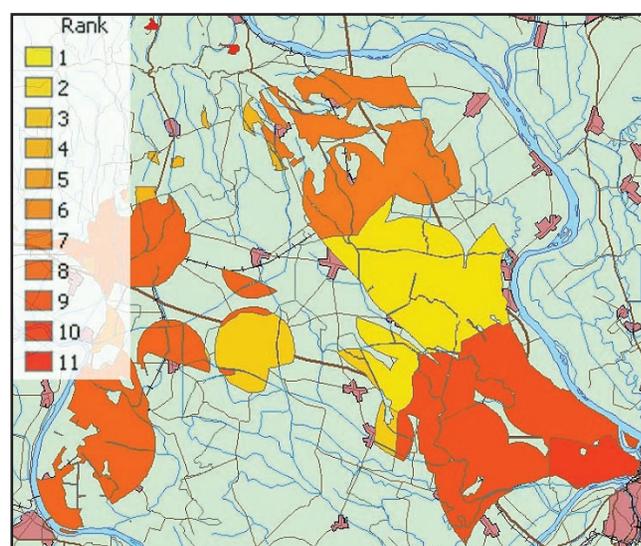
Software System for Sustainable Siting of Industry

For sustainable industrial development, the need of the hour is judicious, reasonable and planned use of the finite resources of land, according to the natural environmental properties. To cater to this need, we are using Geographic Information Systems and Decision Support Systems techniques to help proper siting of newly planned industries and industrial estates. S⁴I is especially meaningful in developing and transition economy countries, where the process of sustainable industrialization is still in its initial stage.

In developing and transition economy countries, the siting of industries appears to follow a random pattern that does not consider the available infrastructures, the allocation of water and other precious natural resources, and the prevention of pollution of water, soil and air. Strategic plans have to be developed in order to improve the plant allocation within industrial areas in such a way as to optimize the land use, the transportation system, the water use and the waste treatment. Therefore, we suggest the use of S⁴I - Spatial Decision Support System (SDSS), a geographic information system enhanced with multicriteria analysis as a proven tool for achieving sustainable industrial siting. Site selection based on environmental criteria (proximity to protected forests, national parks, water sources, etc.) with the objective of minimizing adverse environmental impacts is, therefore, a vital prerequisite.

S⁴I provides a valuable help to spatial planners and other stakeholders, when a decision needs to be made about which areas are the most suitable for an industrial settlement. The process consists of inserting interactive effects of several contributing factors and constraints that may contribute in enhancing or decreasing industrial susceptibility. The constraints are taken into account to create the most suitable areas. Areas included are those that satisfy given criteria like proximity to main railway stations, proximity to main residential areas, and proximity to main roads. Certain areas are excluded from consideration like sea, lakes, rivers, forests, strong erosion areas, areas endangered with floods.

The contributing factors, on the other hand, are used for evaluation of susceptibility, and are connected with municipalities to which a certain area belongs. These factors are total population, local tax policy, average wage and average land price, and so on. Through the multicriteria evaluation, those criteria are combined to form a single suitability map from which the final choice will be made. The output consists of a certain number of categories, each reflecting its susceptibility to the installation of new industries, and is based on a rank of municipality.



S⁴I is a powerful tool for decision making process because it enables taking into account both socio-economical and geophysical criteria. To achieve the easier use of S⁴I the full integration of GIS and DSS is implemented so the users are unaware of existing communication between the two systems.

Technical information

S⁴I is implemented as an ArcView extension using ArcObjects and C# programming language. To perform the multi-criteria analysis it uses the WiseChoice Decision Support System.

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