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A GIS-based Spatial Decision Support System for environmentally valuable areas in the context of sustainable development of Poland

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The issue of spatial development, and thus proper environmental management and protection at naturally valuable areas is today considered a major hazard to the stability of the World ecological system. The increasing demand for areas with substantial environmental and landscape assets, incorrect spatial development, improper implementation of law as well as low citizen awareness bring about significant risk of irrevocable loss of naturally valuable areas. The elaboration of a Decision Support System in the form of collection of spatial data will facilitate solving complex problems concerning spatial development. The elaboration of a model utilizing a number of IT tools will boost the effectiveness of taking spatial decisions by decision-makers. Proper spatial data management becomes today a key element in management based on knowledge, namely sustainable development. Decision Support Systems are definied as model-based sets of procedures for processing data and judgments to assist a manager in his decision-making. The main purpose of the project was to elaborate the spatial decision support system for the Sieraków Landscape Park. A landscape park in Poland comprises a protected area due to environmental, historic and cultural values as well as landscape assets for the purpose of maintaining and popularizing these values in the conditions of sustainable development. It also defines the forms of protected area management and introduces bans concerning activity at these areas by means of the obligation to prepare and implement environmental protection plans by a director of the complex of landscape parks. As opposed to national parks and reserves, natural landscape parks are not the areas free from economic activity, thus agricultural lands, forest lands and other real properties located within the boundaries of natural landscape parks are subject to economic utilization Research area was subject to the analysis with respect to the implementation of investment actions consisting mainly in the agricultural economy. Versatile relief, diversified geological formations as well as the depth of depositing ground water and the risk of flooding have impact on diversified possibilities of the land use. Intensive agricultural economy at large field area and forestry constitute the major human activity at the area of the Park. The criteria which may be in the form of factors (e.g. soil with much agricultural suitability or very low slopes) or limitations (e.g. soils with little agricultural suitability, forest areas in close vicinity of water bodies) constitute the grounds for taking a decision on determining the areas for agricultural economy. The thesis presents the possibilities which Geographic Information Systems provide at the stage of taking spatial decisions at environmentally valuable areas. The pressure on environmentally valuable areas is growing all over the world and it may be assumed that spatial conflicts between the development of agricultural areas and the natural environment will intensify. Spatial planning is the best possibilities of reducing and mitigating this pressure. This process should take into consideration the provisions of the European Landscape Convention which is the basic instrument for landscape preservation and nature protection.