



Application of geoinformation techniques in sustainable development of marginal rural

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The basic objective of the studies is to create a geographic information system that would assure integration of activities aimed at protecting biological diversity with sustainable development of marginal rural areas through defining the conditions for development of tourism and recreation in the identified areas. The choice of that solution is a consequence of the fact that numerous phenomena and processes presented in maps are linked to functional relations or they can be viewed as functions of space, time and attributes.

The paper presents the system development stage aimed at elaborating the template for the system serving solution of the above-presented problem. In case of this issue the geographic information system will be developed to support development of marginal rural areas through selection of appropriate forms of tourism for the endangered areas including indication of locations for development of appropriate tourist infrastructure. Selection of the appropriate form of tourism will depend on natural, tourist and infrastructure values present in a given area and conditioned by the need to present the biodiversity component present in those areas together with elements of traditional agricultural landscape.

The most important problem is to reconcile two seemingly contradictory aims:

1. Preventing social and economic marginalization of the restructured rural areas.
2. Preserving biological diversity in the restructured areas. Agriculture influences many aspects of the natural environment such as water resources, biodiversity and status of natural habitats, status of soils, landscape and, in a wider context, the climate.

Project implementation will involve application of technologies allowing analysis of the systems for managing marginal rural areas as spatial models based on geographic information systems. Modelling of marginal rural areas management using the GIS technologies will involve creating spatial models of actual objects. On the basis of data on location, properties of attributes and mutual relations of objects analyses of synergic influence of specific development forms on the environment and development of rural areas will be carried out. The important aspect here is the possibility of linking the phenomena and processes presented in maps with functional relations, including the space and time function. Application of that solution will allow analysis of actual marginal rural areas management system as a model of object and it will allow application of artificial intelligence as decision support tool. The system designed in that way will be characterized by the following properties:

- it will be modelled and built of mutually communicating objects implemented by software using special object types.
- division of the software into objects will facilitate its analysis.
- dynamic properties of object structures: polymorphism, hermetization and implementation of methods in object structure will be applied.
- objects will be used as the set of system model elements, which will assure ease of its modification.
- specialization of classes will be introduced by means of inheritance of fields and methods [Muller, 2000].

The applied methods of object design coupled with GIS use should allow integration of marginal rural areas management according to the principle of sustainable development.