



The experience of an intrusion of landscape-ecosystems of agriculture convinces, that the problem of security of reproduction both soil conservation and their fertility can not be independent. It should become an integral part of the surrounding program of function reorganization of rural locality. We excrete nine milestones of such reorganization (table 1).

The first step in the realization of the specified strategy should become recreated (with the count of varying economic and legal conditions of last ten years) agroecological geographical demarcation of the Belgorod region coordinated with the dynamics of marginal zones (Russian-Ukrainian border, interregional zones of interaction with the neighbors on Central Tchernozemye). In consequent it will allow on a base of economic (plant-growing-cattle-breeding proportions of frame agro-industrial complex and agroecological criteria to justify optimal frame and complement ability land of agricultural in within the limits of marked agroecological regions.

Table 1

The stages of the all-up regional program of territorial reorganization (function zoning) of rural locality

	The contents of a stage	Parameters of ecological and-socio and economic efficiency
1	2	3
1	The substantiation of a social-ecological optimum of frame of land, fund reflective in the specifications natural features, extent of economic mastering and long-time priorities of steady development	Rational interrelation of the floor spaces agrozones (tillage's, meadows and perennial grasses), pools and ecological fund of lands, including forests. Achievement of territorial ecological balance
2	Function-target zoning of region: industrial zone, including lands of agricultural purpose and operated forests, recreational terrains and ecological framework complementary a sys-	"Development" of the normative floor spaces of lands in the schema of the optimal territorial device of region

	tem apart of guarded natural terrains	
3	Projection by engineer and geographical methods of a framework of soil protecting and ecologically planned agrolandscape- the system of land-arrangement on principles of a contour and reclamation agriculture	Observance of the resources and ecological specifications to ground and water of use, intensifying of environment regulation of functions of a landscape
4	The adaptive strategy on a base biological structural analysis of agrolandscapes, providing placement of agricultural cultures according to the meso- and micro- climatic variations of agro-climatic potential and count of the limiting microzonal factors	Heightening of productivity of agrolandscapes by more complete usage of bioclimatic potential
5	Ecological construction of lands, which one adjoin to a hydrographic net, by binding of riversides and saved zones, in by filtration in the mouth zones of active ravine	Ecological safety of water-currents and (water storage basins, ponds), heightening of their biodiversification and fish productivity
6	The substantiation at a regional level of a rational web of guarded natural terrains providing conservation of a landscape diversification, possibility of study of representative and unique ecosystems, steady reproduction of a gene pool of alive organisms	Achievement of appreciable influence of environment forming of efficiency of the built ecological framework on immunity of regional development
7	Projection of biocentralized network frame of terrain coordinating agrolandscape to adjoining lands with the help of biological corridors, of a continuous or discrete type	Ecological web, connecting through biocorridors "entered" in a plastic of a landscape, the keys natural terrains, bordered

		by bumper zones
8	Ecological rehabilitation of lands: dislocated, blasted by processes of an anthropogenic degradation, door natural lands (sand, place of yields and close burial of bedrocks)	Blockade of the centers of potential development of a degradation of landscapes, building for lands with potentially dangerous development of processes of the rules of nature management
9	Fissile politics of detection and incorporation of landscapes of historic and cultural purpose(appointment) in regional and aboriginal planning for security of conditions of conservation of complexes and plants of cultural inheritance in their natural or artificial environment. Development of architectural solutions creating aesthetically attractive appearance of a landscape	Shaping of uniform legal space for conservation of natural and cultural inheritance. Conservation of beauty both character of landscapes and terrains, exclusion for change of valuable terrains with the historically usual landscape - source of national collective memory(remembrance)

The modern Geographic information systems (GIS-technologies) serve as an informational basis to intensity agricultural industry. We are working out the agricultural GIS of Belgorod region.

Databases of cartographical and analytical information were formed with the help of BelGIS software: the cartographical editor MapProj and the data bases control system NetBase. For this purpose BelGIS has a lot of possibilities to enter and edit graphic elements of the maps, and to form and enter the parametrical information for each element in the form of database.

So vector maps which were made with the help of the software are characterized by the high accuracy and informative level. We used a system of agreed signs according to the standard of digital and polygraphical cartography. It gave the opportunity to make a cartographical data base which can be used as an informational and reference system and be printed with the usage of digital apparatuses.

Besides BelGIS has a lot of functional opportunities for keeping up these database and developing the information and reference cartographical system:

- automotives entering the cartographical data on the base of scanned pictures and geodesic survey;
- making and interactive editing the system of agreed signs for the map;
- making a free structure of analytical database, adding, editing notes and connecting them with the cartographical information;
- making and interactive editing the electronic tables within the map;
- giving the answers to the documents with the pieces of cartographical information in 3D regime;
- using of intra-program language for solving non-standard tasks;

The software was worked out on the base of a core of BelGIS-system, Delphi – language in the operation system Windows95/XP.

Created program modules were connected with the core of BelGIS-system and were tested on the real database.

The theory of methods and algorithms of modeling is working out on the base of the methods of adaptable landscape agriculture and the balance of eco-systems of agriculture.

The aim of our technology is the usage of GIS-technologies which provide the monitoring of land conditions and farm technical equipment, their full exploitation, the crop forecast, to intensity agricultural industry and lower (reduce) its negative influence on the environment.

Table 2

The tasks, which one are decided with the GIS-technology  
for main subsystems of agriculture

Subsystems	Aims
economic	<ul style="list-style-type: none"> <li>- planning of agricultural crops productivity;</li> <li>- calculating of the yield level;</li> <li>- optimization of the structure of agricultural lands and crop rotation;</li> <li>- spatial analysis of agricultural lands.</li> </ul>

agrotechnical	<ul style="list-style-type: none"> <li>- spatial analysis of plants growing;</li> <li>- the yield forecasting;</li> <li>- spatial analysis of harvesting;</li> <li>- spatial analysis of preparing soils for winter, sowing winter crops;</li> <li>- spatial analysis of soil fertility</li> </ul>
reclamation	<ul style="list-style-type: none"> <li>- ecological and soil valuing of soil for agricultural crops;</li> <li>- valuing of necessity of anti-erosion reclamation for a particular field with a settled system of land use;</li> <li>- determination of need for organic fertilizers;</li> <li>- determination of site and features of shelterbelts to stop water flow;</li> <li>- reproduction of soil resources of degraded and low-yield lands.</li> </ul>
ecological	<ul style="list-style-type: none"> <li>- heavy metal control of quality of agricultural production;</li> <li>- creation of ecological infrastructure of land use territory;</li> <li>- valuing of erosive danger and other natural phenomena;</li> <li>- calculation of erosive soil waste;</li> <li>- calculation of admissible erosive soil waste;</li> <li>- calculation of the features of maximum hillside water flow;</li> <li>- calculation of ant erosive hydro technical edifices;</li> <li>- determination of optimal ecological and economic version of land use for each plot.</li> </ul>

GIS is mainly orientated towards the settled system of land use. Another class of tasks appears with its orientation towards rationalization of territorial arrangement of agro landscape.