THE IMPORTANCE OF ELECTRONIC DIGITAL MAPS IN AGRICULTURAL DEVELOPMENT

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Our most valuable resources, in terms of agricultural production and the development of all sectors of rural economy, are directly related to land. If land is utilized correctly and efficiently, it becomes an essential tool for agricultural production, and its productivity increases. In this regard, maintaining a continuous land inventory is crucial for gathering information about land ownership and its utilization patterns.

Land inventory, based on the results of land assessment, plays a significant role in formulating strategies for the development of rural economy, primarily in identifying agricultural production needs. Improving the productivity of agricultural land, increasing the output of products with lower input costs per unit area, and promoting profitable agricultural practices based on scientific principles, such as crop farming and livestock breeding, are all determined by the effective organization of agricultural land. It is essential to allocate all available land suitable for agricultural production. However, the effective planning of agricultural activities cannot be achieved without accurate information about the quantity and quality of each land plot and the improvement measures needed in terms of agrotechnology and land reclamation.

Land inventory is of great importance in specializing agricultural production. Firstly, land inventory should be carried out with high accuracy. To achieve this, land inventory should consider different types of land, such as irrigated lands, perennial plantations, horticultural lands, pasturelands, and other land categories, including fallow lands.

Indeed, when purchasing agricultural products by the state, taking into account the natural and economic conditions of the regions within our republic, the following requirements are imposed on land inventory:

- Preferential location of agriculture in relation to major cities, industrial centers, and processing plants.
- The quantity and quality of land used in agricultural production, as well as its natural conditions.
- Selection of crop types that yield economic benefits in agriculture.
- Specialization of agricultural production.

In addition to these requirements, the total volume of major agricultural products is calculated and the quantity of input materials is determined for each district and region. Land inventory assumes significant responsibility in determining inter-farm and internal land organization, identifying centers of state farms, and delineating production units within collective farms.

The allocation of land for state or public needs, the quantity and quality of agricultural land, the types of land, and the level of their utilization are all based on land inventory. Furthermore, land inventory provides important data for taxation related to land use.

An electronic map is a cartographic representation displayed on a computer screen or monitor, either in the form of digital maps or as a computerized visualization of GIS data. In any case, an electronic map is a digitally equipped cartographic work presented in a software-based form, which incorporates projections made in a conditional coordinate system, accurately defined and compliant with standards. Such sets of cartographic works are also referred to as screen maps.

In real GIS (Geographic Information Systems), when dealing with issues or topics related to digital models, we work not only with lines or dots drawn on paper but also with the complex interdependencies of objects in a given location. Digital maps contain the following information:

- Geometric (dimensional) data;
- Attribute identifiers that describe objects and their attributes;
- Non-geometric topological relationships that define object connectivity. These include orientation (the direction of one object relative to another), adjacency (the presence of shared surfaces), contiguity (the presence of common boundaries or coincidence of points), coincidence (the placement of one object on top of another), etc. Topological classifications are entered into the database during the coding of additional attributes. This process is often automated when converting data to vector format in GIS.

To encode the relationships between objects, logical relationships between objects are represented by identifiers (unique sequential numbers) assigned to the objects that are in close proximity. In this way, the information about the object is defined by providing its characteristics through four main components in the database.

We also encounter some concepts in the table. Dimensional cartographic information refers to digital and graphic data that represents the phase state and size of a cartographic object in the coordinate system (Glossary of Cartographic Automation. M., 1988).

The semantic content of objects on a digital topographic map refers to a part of the information that describes the content and characteristics of an object on a topographic map (OST 68-3.1-98 "Digital topographic maps. General requirements" - M.: SNIIGAiK, 2000).

The spatial-logical relationship between objects refers to the logically related characteristics of objects, defining their spatial state (connection, intersection, containment, etc.) and their movement relative to each other.

The purpose of creating a database is to process, store, analyze, and provide information about specific objects in user-defined areas, as well as to create a software package that allows for the reprocessing, storage, analysis, and transfer of information related to land parcels and individual objects located within them.

The software package includes the following:

- Processing and reprocessing cadastral information on land parcels and individual objects until the formation of a register shape and transferring the data to the district land resources and state cadastral service;

- Searching and obtaining information on land parcels and individual objects based on cadastral numbers, contact addresses, or user names;

- Searching and selecting information on groups of objects based on their type of use and functional nature.

The tasks of creating the "Land Use Database" software package include:

- Designing the structure of the database in the Microsoft Access 2013 environment, including tables, forms, queries, and reports (registers);

- Creating the database of objects and land parcels for land users;

- Designing report templates for submission to the district land resources and state cadastral service in relation to the issuance of certificates;

- Creating a user manual for the software package.

The composition of the database includes tables related to land user objects and land parcels. Creating an electronic mapping system is aimed at solving important issues related to public interests, such as:

- Providing information on land use;

- Generating statistical reports on the state of land resources and their use;

- Conducting work related to compiling a comprehensive list of rights to land plots;

- Formalizing documents certifying the right to land use, the right to temporary land use, and the right of ownership of land plots;

- Initial coordination of the placement of public facilities, acquisition and transfer of land plots, and preparation of materials for entry into city boundaries and changes in administrative-territorial boundaries;

- Development of urban and rural areas;

- Development of rural industries;

- Improvement of land-water relations;

- Evaluation of land based on its value;

- Consolidation of measures to prevent damage and destruction of land plots;

- Support for sustainable use of land resources;

- Implementation of payments for land use;

- Operation of non-residential real estate markets;

- Development of mortgage and others.

In the land information system, a comprehensive database is collected, stored, processed, and provided to the state and private users for each land parcel. An automated land information system can be defined as a collection of software and hardware tools that facilitate the input, processing, storage, and retrieval of cadastral information. The primary Automated Land Information System (ALIS) is a unified coordinate system that enables the integration of this information with other generalized data within the system. The organized gathering, updating, processing, and dissemination of data have become an essential requirement.

The development of new technologies, particularly computerization, has further enhanced the potential of such systems, bringing forth certain conditions and limitations. In the context of market economics, the efficient utilization and development of land resources play an increasingly vital role, making land-related information of significant

importance. Transitioning to automated systems, where data entry is performed by one or two specialists in the land resources and cadastral departments, ensures the smooth functioning of information production processes.

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