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DIGITAL ELECTRONIC CARDS - THE BASIS OF EFFICIENT AGRICULTURAL PRODUCTION

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Abstract: *This article to consider a proposal for the general classification of agriculture as a result of the analysis of research of foreign and national scientists on the compilation of agricultural maps.*

Key Words: *e-agri cards, Global Mapper, ArcGis, Panarama, MapInfo, Surfer.*

1. INTRODUCTION:

Modern agricultural production widely introduces the achievements of science and technology (modern seeding complexes, machines for processing fields, navigation, etc.), the transition to new resource-saving technologies for the production of agricultural products.

However, for the effective use of material and technical resources, soil fertility, and the technologies being introduced, it is necessary to have up-to-date cartographic information.

By the word map, most managers and specialists in agribusiness understand the standard image of a paper map hanging behind the back of the chief agronomist.

Recently, however, the familiar image is giving way to a modern technical successor - a multi-layered electronic map of farmland created using high spatial resolution satellite images. Electronic fields have several advantages over paper ones. The main advantage, for example, is that every object in the field is completely autonomous. In other words, each object has a number of its characteristics, which are stored in the database of the electronic field. In addition to objects, each field also has its own passport, a list of planned and completed works, agrochemical characteristics of the land, etc. All this is stored in a computer-created database, which allows you to show everything you need with one click, there is no need to dig into papers, and each to make amendments there. This structured information is an excellent management system for an agricultural organization. If desired, you can enter into such a database information about the plants grown in the field, and in the future use it to record the operation of agricultural machines when performing technological operations.

1.1 There are three main methods of collecting raw data for creating electronic maps:

- Measurement of fields using a high-precision GPS / GLONASS receiver in the field (more accurate and correct method);
- Processing of high-resolution satellite images (less accurate, but often faster and cheaper method);
- combined method, i.e. an electronic map, created from satellite images of high spatial resolution, is edited right on the field using a GPS / GLONASS receiver. The last method is the most accurate.

All these methods in the hands of specialists allow to record with high accuracy not only the area of fields of your farm, but also the location of all related objects (roads, settlements, rivers, forest belts, power lines, etc.). On average, as a rule, the true areas of fields are less than those that appear on the old maps. This is due to the overgrowing of fields, the removal of part of the area from crop production and the inaccuracy of old maps. Already one more correct measurement of the area of the farm pays for the creation of an electronic map, because the required amount of seeds, fertilizers, plant protection products and other means of production is determined based on the cultivated areas of the farm. Therefore, now very many farms are concerned with the creation of electronic maps to restore order to a new modern level.

An electronic map of fields is done once, and over time it becomes only more detailed (as the database becomes saturated, new objects and work marks are added to the map). Without any special problems, it can be converted, if necessary, from one cartographic format to another.

2. LITERATURE REVIEW:

Applied research aimed at improving the toolkit of digital electronic maps - the basis of efficient agricultural production was carried out by: Debolini, M. et. al (2013); Williams, C. L. and et. al (2008); Patel, N. R., Zoning, A., &

Patel, N. R. (2002); Hiloidhari, M., Baruah, D. C., Singh, A., Kataki, S., Medhi, K., Kumari, S., Thakur, I. S. (2017). Issues of digital electronic maps in agriculture are reflected in the works of the following scientists: Musaev (2019); Rakhmonov (2018); Narbaev (2019 a, b); Durmanov et al. (2019 a, b); Babazhanov (2019). The main goal of the study was to develop the theoretical and methodological foundations of cadastral valuation of land, assessment of the land resource potential of agriculture in the Republic of Uzbekistan in the context of intensive land use of electronic agricultural maps.

3. METHOD:

Research methods to solve the set tasks used a systematic approach, monographic observation, an abstract approach, methods of numerical modeling, etc. The research was carried out using actual data from the National Center for State Cadastre, Geodesy and Cartography, the State Committee of the Republic of Uzbekistan on Land Cadastre, State Committee of the Republic of Uzbekistan on Statistics

4. FINDINGS AND DISCUSSIONS:

Systematizing the process of creating any type of card is closely related to the development of the program of the card. Includes the following sections for creating a card application [1, 2, 3]

The technological part of the card program shows the new technological methods that can be used in the creation of maps and atlases, ie the possibility of using computers, software and other new equipment [4, 5, 6]. During the study, the mapping of agriculture was carried out in the following stages:

Step 1: When compiling an electronic agricultural map, first study the quality and quantity indicators of the total agriculture available in the mapped area, analyze the previously created cartographic works, i.e. collect and analyze the initial data. As a result, thematic (meaningful elements) layers of the agricultural electronic map are produced [7, 8].

Step 2: Selecting the mathematical basis of the card can be done in several ways. Unlike traditional methods, it is done in a simple way as a result of the development trend of today's technologies [9, 10]. An example of this is the electronic cards or space photos on duty. During the study, the mathematical basis of the next electronic card was selected to create the agricultural electronic map.

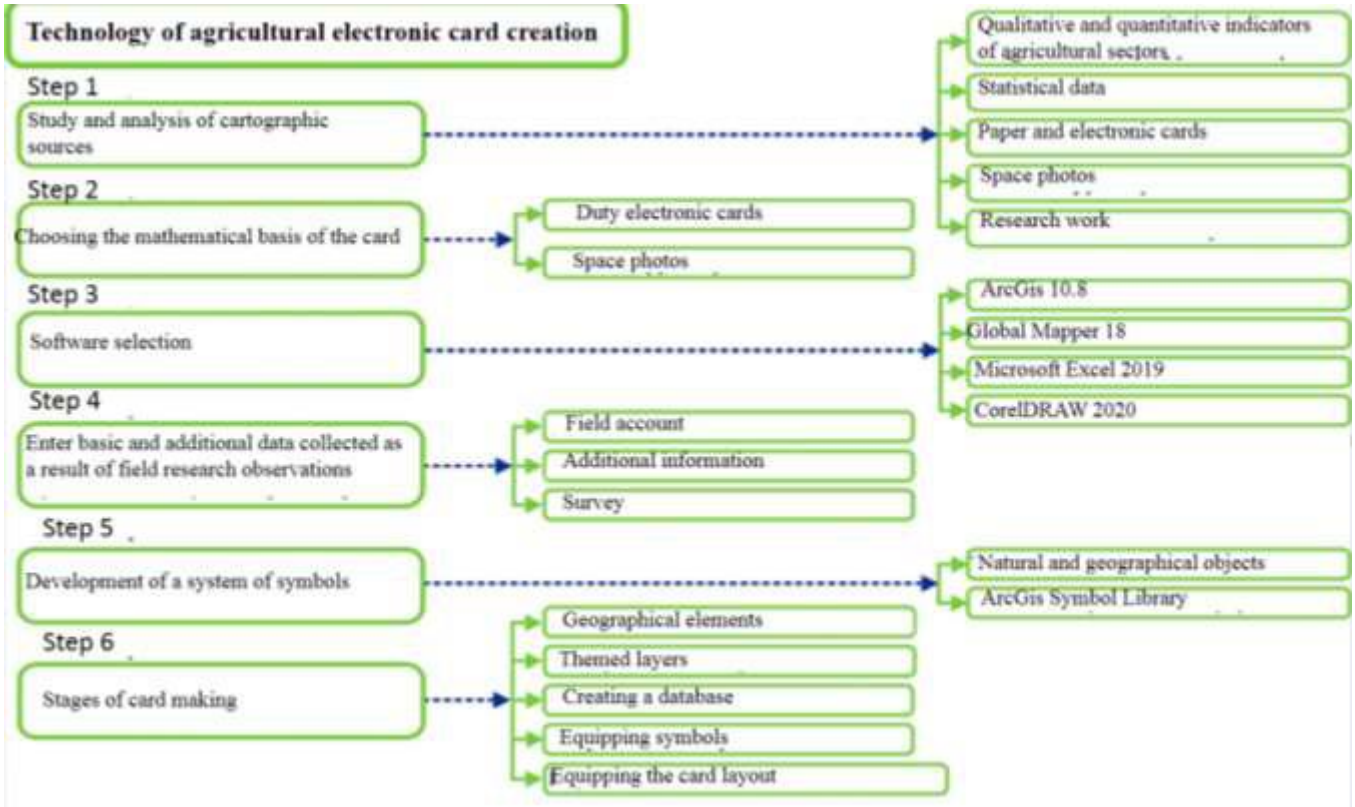

Figure 1. Technology of agricultural electronic card creation

Phase 3: There are currently many types of software belonging to the GAT family for creating digital and electronic cards (Global Mapper, ArcGis, Panarama, MapInfo, Surfer, etc.). ArcGis software, owned by Esri, was used to create the agricultural electronic map.

Step 4: Field research observations will be carried out after the completion of the data entry process in terms of regional distribution of quality and quantity indicators of all types of agricultural sectors and determination of the geographical location of objects. This process mainly involves the process of determining the location of agricultural infrastructure facilities in the region through GPS (global position system) receivers and uploading them to the electronic map. During the field research, the district Department of Agriculture, Department of Veterinary and Livestock Development, veterinary pharmacies, State Center for Diagnosis of Animal Diseases and Food Safety, Department of Agro chemistry, Secondary Special Vocational College, maintenance of agricultural machinery and fuel the geographical location of agricultural infrastructure facilities such as injection stations was determined using a Trimble Juno 3 GPS device and copied to an electronic map. In this process, an additional database was created based on the properties of each object [11]. This information is generated on the basis of a pre-prepared account and additional information identified at the research site.

Additional information is information that serves to give you a better idea of the object in the research process. This information can consist of oral, written, and questionnaires that allow analysis and evaluation of the agricultural character of the area [12].

In the 5th stage, a system of symbols of the agricultural electronic card will be developed. The structure of the system of symbols is described in 2 types. In the first round, the natural and geographical features of the mapped area were developed using standard-looking symbols on a 1: 10,000 scale plan, and thematic elements were developed using a library of symbols in the ArcGIS program [18].

Step 6. At this stage, including the process of creating an electronic agricultural map, all thematic layers of the map are uploaded to the ArcGIS program, and general equipment work is carried out [13]. As mentioned above, the basis for the electronic agricultural map is a measurement map for all types of agricultural crops for the yield on irrigated arable land in the array [14, 15].

Summarizing and systematizing the above steps, the technology of creating an electronic map of agriculture is formed. Based on the sequence of steps given in this technology, it is possible to create an electronic map of the agricultural area to be mapped [16, 17].

5. RECOMMENDATIONS:

1. When implementing the state land cadastre in modern conditions of intensive land use, it is necessary to take a detailed account of the climatic, ecological and qualitative characteristics of soils, which have a direct impact on the formation of the cadastral valuation of agricultural land [16]. Information from the state land cadastre must contain reliable and complete information on the technical, geographical, environmental, special and economic indicators of the land plot.
2. When carrying out work on the state cadastral assessment of agricultural land, it is necessary to take into account their ameliorative condition, which, if properly operated, ensures the improvement of land and an increase in fertility. Reclamation lands must be allocated to a group that is part of agricultural lands with their obligatory registration and registration in the state land cadaster.
3. When determining the cadastral value of agricultural land, it is necessary to ensure fair taxation for different categories: for rained lands - 0.3%; for irrigated lands - 1.5%.
4. Drawing up a passport for a land plot will allow for economic incentives for the protection and use of land, prevent irrational land use, and actively involve agricultural land in land circulation.

6. CONCLUSION :

Analysis of the results of solving the assigned tasks allows us to draw the following main conclusions. Prospects for the further development of the topic, namely, the use of mathematical and digital electronic agricultural maps, including multifactor models in planning and organizing land management works, are associated with further improving the quality of modeling results, taking into account the feasibility of preventing the irrational use of land resources and implementing a set of environmental factors ... It is of scientific and practical interest to zoning the territory of the country according to current and forecast indicators of the efficiency of the use of land resources; calculation of the efficiency of the use of agricultural land and the application of the results of the cadastral, digital assessment of the lands of settlements to increase the efficiency of land use when they are transferred from the category of agricultural lands in other regions of the Republic of Uzbekistan.

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