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СОДЕРЖАНИЕ

СЕКЦИЯ: НАУКИ О ЗЕМЛЕ

Підлозний Ілля Володимирович,
Сугоняк Яна Василівна, Костенко Юлія Миколаївна,
Непша Ярослав Юрійович (Мелітополь, Україна)
ПРИРОДНО-РЕКРЕАЦІЙНИЙ ПОТЕНЦІАЛ ЯКИМІВСЬКОГО КУРОРТНОГО РАЙОНУ ПІВНІЧНО-ЗАХІДНОГО ПРИАЗОВ'Я 6

СЕКЦИЯ: СЕЛЬСКОХОЗЯЙСТВЕННЫЕ НАУКИ

Ashurov A.F., Imomov Sh.J., Abdisamatov O.S.,
Pirnazarova G.U., Yusupov.F.F. (Tashkent, Uzbekistan)
GIS IS AN EFFECTIVE TOOL FOR LAND MANAGEMENT OF HOUSEHOLD AND DEHKAN FARMS 11

Ристо Елена Викторовна (Омск, Россия)
СИСТЕМА ОБРАЩЕНИЯ С ОТХОДАМИ В САНКТ-ПЕТЕРБУРГЕ. ВЫБОР ОПТИМАЛЬНОЙ СИСТЕМЫ ОБРАЩЕНИЯ С ОТХОДАМИ 17

СЕКЦИЯ: ФИЗИЧЕСКОЕ ВОСПИТАНИЕ И СПОРТ

Ажибаева Салима Джолдасовна,
Иралина Мира Мустакимовна,
Мендигалиева Шолпан Абдиевна,
Сулейменова Аделина Васильевна (Алматы, Казахстан)
ПРОВЕДЕНИЕ ПРАКТИЧЕСКИХ ЗАНЯТИЙ ПО ФИЗИЧЕСКОЙ КУЛЬТУРЕ ДИСТАНЦИОННО 21

Бабаев Гасан (Нахчыван, Азербайджан)
О ФИЗИЧЕСКОМ ВОСПИТАНИИ В ЭПОСЕ "КИТАБИ-ДАДА ГОРГУД" 25

Галин Раиль Мадзакиевич,
Стрельцов Даниил Александрович,
Исмаилов Меджид Муслимович,
Лямзин Евгений Николаевич (Москва, Россия)
ДНЕВНИК ТРЕНИРОВОК И САМОКОНТРОЛЬ СПОРТСМЕНА 33

Мамбетов Муталхан Капанович,
Есимбеков Калдыбай Азимбаевич,
Шералиев Абубакир Нышанович,
Балабеков Мухтар Сағынтаевич (Шымкент, Қазақстан)
ЖАРЫСТЫҢ АЛДЫНДА СПОРТШЫЛАРДЫ ПСИХОЛОГИЯЛЫҚ ДАЙЫНДАУДЫҢ АЛҒЫ ШАРТТАРЫ 38

Мухамбеткалиева Гульнара Горкиевна,
Курбанов Шухрат Шерипжанович,
Ихсанов Усин Марданович,
Кондратенко Светлана Анатольевна (Алматы, Казахстан)
ВЛИЯНИЕ ФИЗИЧЕСКИХ УПРАЖНЕНИЙ НА ОТКРЫТОМ ВОЗДУХЕ НА УРОВЕНЬ ЗАБОЛЕВАЕМОСТИ СТУДЕНТОВ 43

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GIS IS AN EFFECTIVE TOOL FOR LAND MANAGEMENT OF HOUSEHOLD AND DEHKAN FARMS

Abstract. *The importance of rural settlements, in particular the role of household land fund in the national economy outlines in this article. The indicators of the agricultural production, livestock production and their low profitability, nutritional deficiencies and ways to solve these problems are given. The heads of dehkan farms in different regions have analyzed the results of surveys, expenditures for the production of agricultural produce and the organization of production, and the average production volume on the land plots. The perspectives of continuous development of land use in peasant farms. Moreover, the perspectives of GIS application in managing the use of land and peasant farms are highlighted. One of the key factors in sustainability of land use is the efficient organization of the use of natural resources. Dekhkan farms on a systematic basis, including the creation of normal conditions for the livehoods of the population, the provision of agricultural products to a rural family through the introduction of resource-saving technologies and the optimization of the use of the territory of a private land plot, justified year-round rotation of crops, export of some surplus manufactured products, restoration of soil fertility should be developed.*

Keywords: *Land fund, types of land, resource, hard worker, rent, massive, horticulture.*

INTRODUCTION

The development of a market economy requires the rational use of all types of resources and, above all, land. An important role in the land use of the country is played by the lands of rural settlements and, especially, the household land fund. Its effective use contributes to an increase in the production of agricultural and livestock products in the country, the development of small business and private entrepreneurship, an improvement in the supply of food to the population, an increase in employment, and a rise in rural incomes. "A rural worker is a solid pillar of life, a strong pillar of our well-being," emphasized the President of the Republic of

Uzbekistan Shavkat Mirziyoyev at the solemn meeting on the Day of Agricultural Workers on December 9, 2017. It was referred in his speech that "In the field of agriculture, there are still unutilized opportunities that are waiting for their solution to problems and shortcomings." In his speech, "445 thousand hectares of the most fertile land were transferred to the population as personal plots of land." But the use of these sites is low." [Speech at the ceremonial meeting December 9 2017]. In order to take advantages of one of these opportunities, the one indicated at the speech of the President of the Republic are largely determined by the all-round increase in the efficiency of land use by dekhkan farms. Despite significant achievements in the development of dekhkan farms, there are still problems in the land use of rural settlements and, first of all, in dekhkan farms: improving the reclamation state of the land, issues of providing livestock with feed, pasture territories, and providing sublease of land [The concept of the use of land and water resources in agriculture]. Real vesting of the right of lifetime inheritance ownership of a private land plot with a pledge obligation, development of a mortgage, improvement of the condition of roads and transport communication services, issues of processing grown products, issues of introducing scientifically grounded crop rotation on a private land plot, etc. All this requires its solution and further improvement of the legal framework for land use in rural settlements. An analysis of the state and use of the existing lands of rural settlements indicates the insufficient efficiency of their use, including the lands of dekhkan farms. The free use of land, which for many years determined the mismanagement of land in our country, contributed to the wasteful, irrational use of this valuable resource, which led to hypertrophied growth of the territories of settlements and to unreasonable seizure of agricultural land for construction in excesses. The length of engineering and transport communications has increased, the environment around settlements has degraded, and the cost of all types of arrangement of their territories has grown [Proshlyakov, 1964]. All this negatively affected the efficiency of the use of a personal land fund and the quality of population. The main reasons for this situation were the lack of reliable accounting of the lands of rural settlements, the necessary urban planning documentation for their comprehensive development, the deterioration of the ameliorative state of the lands in the arrays of rural settlements [Tatur,1975].

MATERIALS AND METHODS

During the agrarian and land reform in the countryside, a new organizational and legal structure of management was formed - the small-scale dekhkan family farm, producing and selling surplus agricultural products (based on the personal labor of family members on a private land plot provided as a lifelong legacy of mine possession) [The law of the Republic of Uzbekistan]. The dynamics of production shows that the share of this type of farm in the total gross agricultural output is constantly increasing and amounts to 81% of potatoes, 56% of melons, 66% of vegetables, 50% of grapes; almost all the country's cattle are concentrated here - 6.5 million heads (92.8%), including cows 2.8 million heads (94.5%); they account for 95% - meat, 97% - milk, 57.9% - eggs, 71.7% - wool produced in the country [The Land Code of the Republic of Uzbekistan].

At the same time, analysis of the current state and use of private land in the republic indicates that their potential capabilities are far from exhausted. In household plots, they receive mainly no more than 2 crops, due to which dehkans meet their needs for potatoes and vegetables, and sell the surplus on the market. Crops such

as early (winter) cabbage, beets and some others are still rarely practiced. Livestock indicators are quite low; the lack of feed is due to the small area of the land. The garden is primarily engaged in food crops. The high-quality land of personal plots is low. Mineral fertilizers are often not applied in sufficient quantities, watering is not always carried out in the best agro-technical time and with the required norm, the lands of villages are not infrequently located on massive saline lands, and the collector-drainage network within the villages is not cleaned in a timely manner. There is no optimization of the structure of cultures and their economically feasible alternation in a garden.

Surveys of dehkans in different regions of the country showed that the cost of doing business is 1000-2000 thousand soums. (excluding livestock costs), the cost of production is 4000-6000 thousand soums, income – 2000-4000 thousand soums. or an average of about 3000 thousand soums per family. More than 85% of dekhkan farms contain livestock and poultry. About 70% of households have dairy cows, including 35% and fattening bulls. The productivity of cows on farms is quite low - about 1700 kg of milk. About 1,100 kg of milk and 150 kg of meat are consumed annually on average per family, which amounts to 3.3 and 5.25 million soums, respectively. The cost of the realized farm products from animal husbandry averages 3.7 million soums, and in general, taking into account crop production 4.9-5.0 million soums. The average consumption by the family of cultivated products is 60-65% (approximately 3.2 million soums), the rest of the products are sold on the market. The experience of advanced dekhkan farms and research show that their effectiveness can be increased by three to four times.

Decree of the First President of the country I.A. Karimov from 03.23. 2006 No. PP-308 for the purpose of further development of dekhkan farms, strengthening their role in agricultural production and providing state assistance to the rural population, persons involved in raising cattle in private household plots have the right to establish work books and register work experience. In addition, it provides for the allocation of low-income families through sponsorship of cash cows. The number of livestock is increasing, but providing them with feed remains as a problem. The security of animals with their own feeds is insufficient (25-30% due to corn, barley meats and vegetable stems) [Ashurov A.F, 2009]. Particularly short of pasture land and pasture fodder. Currently, in the Republic, almost all agricultural land has been distributed to farms and not every farmer allows representatives of dekhkan farms to graze cattle even on the outskirts of their plots or to harvest hay on the farm. Summer and winter pastures are located very far at great distances from settlements.

RESULTS AND DISCUSSION

One of the key factors in sustainability of land use is the efficient organization of the use of natural resources. Dekhkan farms should be developed on a systematic basis, including the creation of normal conditions for the livelihoods of the population, the provision of agricultural products to a rural family through the introduction of resource-saving technologies and the optimization of the use of the territory of a private land plot, justified year-round rotation of crops, export of some surplus manufactured products, restoration of soil fertility. The following aspects of the prospective development of land use of dekhkan farms can be outlined:

1. **The rational organization of the territory of dekhkan farms;**

This aspect provides for the rational distribution of residential and utility rooms, many-year-old plantings and crops (vegetable garden) and land on the territory of a

personal land plot. The most appropriate form of it is rectangular, providing the most effective layout of the territory for construction, placement of the garden and vegetable garden. The layout of the personal plot should provide maximum amenities for family living, housekeeping and recreation, the necessary sanitary and hygienic conditions and fire safety, the efficient use of land and water, in harmony with the improvement of the village.

2. **Allocation of additional territories from the number of irrationally used and unused lands (including pasture lands);**

Not all dekhkan farms have the corresponding areas indicated in the Land Code of the Republic. If we analyze the dekhkan farms that are successfully functioning and produce good indicators, their areas can be expanded to normal. It is necessary to develop a mechanism for the allocation of pasture territory. The expansion of the land use territory of the dekhkan farm should be carried out taking into account the resources available to the family (financial and labor), guaranteeing the efficient use of land.

3. **The rational distribution of crops and land;**

It provides with the selection and placement on household plots of such types and varieties of crops that provide the necessary optimal alternation all year round. At the same time, the continuous alternation of crops should not deplete the land, but rather restore and increase soil fertility. To envisage restoration of soil fertility based on a rational system of farming, the introduction of soil-protective technologies, and the conservation of humus. Land, when used properly, restores its productive properties. The development of society, the continuous growth of its population and needs objectively require an expanded nature of agricultural production, which is the reason for the need for expanded reproduction of soil fertility [Talipov, 1992].

4. **The use of geographic information systems (GIS);**

The problem of managing land resources of rural settlements and, above all, of a personal land fund has always been relevant. The increase in the subjects of farming on the earth as a result of the increase in the population of the household land fund initiated the expansion of the circle of participants in land relations. Modern work on territorial planning, land management, cadastre, and environmental assessment will certainly involve the use of geographic information systems (GIS), which make it possible to make cardinal changes in the industry of information support for management decisions [Paul Longley, 2005, p. 517].

The lands of household and dekhkan farms of the Surkhandarya region, which is an ideal testing ground for the development of a land management information supports the system using a GIS based on land inventory for operational management decisions, were selected as the object of the research.

To create a land management system for households and dekhkan farms using GIS technologies, we used the method of system analysis of rationality of land use and allocation of areas of irrational land use, misuse, lands observation methods: by yard, geodetic surveys inventory areas, methods of organizing data by creating a geodatabase, methods of spatial-logical modeling.

An automated cartographic system (ACS), which is the core of the GIS for land management of households and dekhkan farms, is developed and tested for a fragment of land in homestead and dekhkan farms, and is a set of software tools that ensure the creation and direct use of maps.

The creation of a complete GIS management of the territories of household and dekhkan farms is expediently carried out in 2 stages: preparatory and production.

The preparatory phase includes: collection, analysis and systematization of archival land and cadastral data, planning and cartographic materials, land management documentation for land (allotment materials, land inventory materials, land records), as well as data on the composition and population.

In order to clarify and update the planning and cartographic material, as well as to speed up and reduce the cost of work, you can use remote sensing data, refined during the production phase during geodetic survey.

In addition to geodetic surveying and courtyard by pass, land management and cadastral works are carried out at the production stage, during which the application and adjustment (refinement) of the border, the boundaries of the land territories of households and dekhkan farms, the borders of individual land mass and plots are carried out.

As a result, digital terrain maps are generated, and a geodata base (GDB) is compiled.

Land plots are formed using topological rules, which allows to excluding incorrect data, such as overlapping land plots or vice versa, the gap between them.

The geodatabase is a spatial-logical model that can be used to:

Inventories of land for household and dekhkan farms;

- Tracking the state of engineering communications networks;
- support, updating and development of the general plan of the rural settlement, building of detailed planning projects;
- information support of the choice of a place for the construction of storage facilities, warehouses of commercial facilities (for example, procurement organizations), requiring a preliminary detailed spatial analysis of the territory;
- information services and consultations for potential users of land and real estate: spatial information about the standard and market value of land plots, cartographic services of real estate databases.

CONCLUSION

The large amount of accumulated information and the integration of geographic information systems (GIS) allows you to quickly and fully meet the most diverse information needs, both in content and in form - in the form of reports, thematic maps, analytical results in electronic and paper form for information support of management decision-making.

Testing the results of the study, which carried out on the example of the lands of Prius-Debt and dekhkan farms of the Surkhandarya region, showed that GIS is an effective tool for managing land resources in the territories of rural settlements, for example:

- in the field of economics - determining the current state of land use, identifying opportunities for optimizing and improving the use of land in private and dekhkan farms in the region by changing the territorial and sectoral structure of lands, analyzing its condition and development trends.
- in the field of ecology - identifying the features of the ecological state of the land and preventing the development of negative processes.

Reliable and complete information about land resources contributes to an increase in budget revenues from land payments, the organization of its rational use

and protection, the operational regulation of land relations and the introduction of a regulated land market.

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