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EFFICIENCY BASIS USE OF UNMANNED AERIAL VEHICLE UNDER CONDUCTING MONITORING OF AGRICULTURAL LANDS

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ABSTRACT
The article notes that unmanned aerial vehicles are widely used in various fields, as well as the results of field experiments on improving new technologies and their economic efficiency. Monitoring of agricultural land takes a lot of time, and now one of the advanced technologies is the introduction of unmanned aerial vehicles in agriculture, which makes it possible to effectively use time for monitoring agricultural land. Currently, the use of unmanned aerial vehicles in cartography and agricultural monitoring in Uzbekistan has proven to be more effective than traditional methods.

KEYWORDS: unmanned aerial vehicles, monitoring of agricultural land, aerial photography, interpretation.

INTRODUCTION

It is necessary that the unmanned aerial vehicles are successfully complied with the rules of flight of the Civil Aviation [1]. On August 31, 2016, the Cabinet of Ministers approved an important document on the sphere – the regulation on the application of unmanned aerial vehicles in the civil and State Aviation of the Republic of Uzbekistan. Therefore, it is used in various fields in different states:in agriculture, industry, construction, in engineering Geodesy, in metrology, cartography, ecology, in hazardous areas of human life, etc.k

FEATURES OF UNMANNED AERIAL VEHICLES

- Planned topographic aerial photography for the creation and updating of digital topographic maps on a scale of 1: 100-1: 1000;
- Aerial photography of engineering structures and infrastructure facilities (industrial sites, power lines, roads and railways, pipelines for oil, gas and other products) for remote determination of technical condition;
- Aerial photography for the purpose of various types of decoding;
- Preliminary survey of the site and long-range (perspective plan) aerial photography [2];

UNMANNED AERIAL VEHICLES ARE USED IN THE FOLLOWING DIRECTIONS

- monitoring (technical control of buildings and facilities in agriculture, construction and utilities) [3,4];
- close-up image (processing (restoration) and control of monuments in the field of archeology, architecture) [4];
- cartography (mapping, updating and large-scale creation) [4];

Functions of unmanned aerial vehicles in agriculture:

- on-site inspection and guidance of lands [5]; - monitoring of the state of melodic construction; - Creating an index of vegetative state in the clarification of the soil system; - Carrying out agro-technical measures in land use at the level required by law [5].

The purpose of the study. Decree of the President of the Republic of Uzbekistan No. PF 5065 of May 31, 2017 "On measures to strengthen control over the rational use and protection of land, improving the activities of geodesy and cartography, regulation of state cadastres" and the Cabinet of Ministers of the Republic of Uzbekistan dated March 14, 2017 No. 258 According to the Decree No. F "On monitoring of agricultural crops, development and modernization of technical and technological development in the mapping of the territory" it is necessary to provide agricultural lands with fast and high-quality cartographic products based on cost-effective, modern technologies.For this purpose, it is advisable to use modern unmanned aerial vehicles in the territory of Uzbekistan [6].

Figure 1 An overview of the Ptero G1 unmanned aerial vehicle

Table 1Technical specifications of the unmanned aerial vehicle Ptero G1

№	Technical capabilities	**Ptero G1**
1	Rechargeable fuel	Gasoline Ai-95
2	Total weight	20 kg
3	Load bearing weight	Up to 5 kg
4	Flight	Up to 800 km
5	Maximum lifting height	300 m
6	Flying speed	85....125 km / h
7	Flying time	Up to 8 hours
8	The temperature at which it can be used	-30...+40ºS

RESEARCH METHOD

The creation of the permitted and required accuracy cartographic product of aerofotos materials obtained with the An-2 aircraft and Ptero G1 unmanned aerial devices, as a result of their cost-effective comparison. The time and funds spent on the processes performed for the use of aerofotos materials as a finished product are compared. It is necessary to choose an effective method based on the results. As noted above, the aim of the study is to provide agricultural land with quality cartographic product in a short period of time. This is based on the fact that the process of monitoring in agricultural lands prefers the use of new modern technologies.
At present, several works are being carried out on the introduction of modern technologies, their effective use by the state-of-the-art Unitary Enterprise "Geoinformkadastr" in the system of "Davergeodezkadastr" of the Republic of Uzbekistan in the promotion of the use of modern unmanned aerial vehicles manufactured in developed countries on the territory of Uzbekistan. In particular, monitoring of agricultural crops is carried out. One of the modern technologies used by the enterprise today is the PTERO G1 unmanned aerial vehicles [7].

ANALYSIS OF THE RESULTS OBTAINED

As a result of the application of unmanned aerial devices in agriculture, it is possible to create an electronic card of the field automatically by aerosols, as well as automatic processing of information, transfer of agricultural crops from the inventory, evaluation of the amount of work done and control their implementation, operative monitoring of the status of crops, control of the originality of agricultural, it also provides the ability to analyze as you see on the screen (Table 2) [8].

Table 2 In the process of monitoring the agricultural land area analysis of their work

№	Name of action	Performed on the plane An-2 (archive data)*		Performed on the plane An-2 (archive data)*	
		unit of measurement	unit of measurement	hour sum	hour sum
	Measurement of land area	hour sum	hour sum	4 71000	4 71000
2	Comparison of measurement results with map	20 334000	20 334000	30 minutes 2500	30 minutes 2500
3	Introduction of data into an electronic database	1 26500	1 26500	31 minutes 11000	31 minutes 11000
4	Calculation of measurement results	2 38500	2 38500	32 minutes 1500	32 minutes 1500
5	Aerophotos'yomka the Earth's field	1 6000	1 6000	2 35500	2 35500
6	Separation and monitoring of crop area by Types	1 1500000	1 1500000	32 minutes 4000	32 minutes 4000
	Total:	(Up to 100 square)	(Up to 100 square)	8 125500	8 125500

CONCLUSION

As new technologies developed, new opportunities were opened before Geodesy, topography and cartography, and it was possible to increase the productivity and accuracy of work performed. Modern information technology creates opportunities for the preparation and distribution of complexes of dynamic cards by updating geographic databases, filling out the contents of structured cards and reproducing them [8]. the results of measurements of land areas using An-2 aircraft and unmanned aerial devices were compared. Based on the results, if the area of 100 hectares is studied in 26 hours with the help of an aircraft, the drone will spend 8 hours on the same volume of work when flying devices are used. Based on the data presented in Table 2, it should be noted that time is 3 times more efficient than traditional methods and economic efficiency 100. it will be possible to save 1785500 rubles per square meter.

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