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DEVELOPMENT OF GEOGRAPHIC INFORMATION SYSTEM (GIS) TO CHANGE THE LEVEL AND LEVEL OF SOIL SALINITY IN SYRDARYA REGION

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Аннотация: В Республике, особенно в Сырдарьинской области, состояние мелиорации орошаемых земель и засоление почвы неразрывно связаны с уровнем подземных вод, их засоленностью и движением. Уровень подземных вод и их соленость во многом зависят от технического состояния дренажных сетей и количества атмосферных осадков, запаса пресной воды в течение вегетационного периода и движения подземных вод извне. Обсуждается будущее использования ГИС в различных областях. сфера. ГИС даёт возможность собирать данные, обновлять их или использовать новую информацию в анализе. Это требует быстрого изменения информации ГИС о Земле, потому что процедуры на Земле динамически изменяемы. Периодически изменяющаяся информация в ГИС дает нам возможность получать новую информацию и анализировать ее. ГИС-технологии и технологии стали широко использоваться во всех сферах человечества. Важно знать его свойства.

Ключевые слова: ГИС, управление водными ресурсами, ирригация, интегрированное управление водными ресурсами (ИУВР), Узбекистан, речной бассейн, сельское хозяйство.

РАЗВИТИЕ ГЕОГРАФИЧЕСКОЙ ИНФОРМАЦИОННОЙ СИСТЕМЫ (ГИС) ДЛЯ ИЗМЕНЕНИЯ УРОВНЯ ПОЧВЫ В СЫРДАРЬИНСКОЙ ОБЛАСТИ

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Abstract: In the Republic, especially in the Syrdarya region, the reclamation state of irrigated lands and soil salinization is inextricably linked with the level of groundwater, their salinity and movement. The level of groundwater and its salinity depends largely on the technical condition of the drainage networks and the amount of atmospheric precipitation, the supply of fresh water during the vegetation period, and the movement

of groundwater from outside.. Discussed future of using GIS in different sphere. GIS gives possibilities to collect the data, renewing it or use new information in analysis. It requires quick change of GIS information about Earth because procedures in the Earth are dynamically changeable. Periodically changing information in GIS gives us possibility to get new information and analyze it. GIS technologies and techniques started using widely in all sphere of humanity. It is important to know its properties.
Keywords: GIS, water management, Irrigation, Integrated Water Resource Management (IWRM), Uzbekistan, River basin, Agriculture.

Introduction. Development of Geographic Information System (GIS), occurrence of salinization and water logging, crop extinction, etc. in the agricultural field.For a stable and high yield from agricultural crops, there must be an optimal combination of all the factors that are essential to the life of the plant. For the process of photosynthesis: the necessary moisture and nutrients in the soil; thermal energy of the atmosphere in the upper soil layer; water exchange should be provided to the surface.

The GIS (geographic information system) technology is being developed to improve GIS-based data analysis based on field experiments when assessing factors affecting land reclamation. [1]

GIS is currently widely used and implemented in agriculture and water management and land reclamation monitoring not only in Uzbekistan, but also all over the world. Data analysis and transmission and storage within the GIS are addressed in GIS.

Methods and materials. Therefore, the task of GIS is to receive, collect, analyze, store and transmit data in any format. Being able to access any of these data formats and accessing the program will further enhance GIS capabilities. The ability of GIS to conduct various statistical analyzes, mapping and creation of various databases ensures that it is more relevant and popularized in the area of land and water conservation (Tsihrintzis et al., 1996, Lyon 2003). Therefore, the task of GIS is to receive, collect, analyze, store and transmit data in any format. Being able to access any of these data formats and accessing a meal program will further enhance GIS capabilities. The ability of GIS to conduct various statistical analyzes, mapping and creation of various databases ensures that it is more relevant and popularized in the area of land and water conservation (Tsihrintzis et al., 1996, Lyon 2003).

Using GIS in water management of Central Asia started to develop after 2000, after the implementation of water management in this region. To supply the integrated and regular water management, to create irrigation sets and objects, water users, vegetation type and area database and maps for regional and global scale, and analyze it rapidly was the main problem of water managers. During its long time experiments water management found an answer to this problem. It was using new computer technologies and scientific achievements to water management. This component was added to Central Asian water management plan. As a result the scope of work in this field expands.

GIS Digital Database Analysis and Database Creation Since the 1920s. Improvement of GIS and installation of personal computers started in the 1970s. Since the 1980s, scientists have begun to use GIS in natural and technical sciences. With each passing year, GIS began to improve and become more widely used in various industries, and the capabilities and content of the community began to grow. Upgrading capabilities and the program has increased its use in various areas. As can be seen from the above, the use of GIS in solving various problems increased 2.5 times from 2000 to 2015 (Tsihrintzis et al., 1996).

GIS has been used for many years in agriculture and water management. Awulachew et al. Automatic data transmission is achieved. Creating a unified system of water and land surveillance and establishment of a centralized system is currently the main task of the GIS sector.

We have the following advantages when monitoring the reclamation of irrigated lands on the basis of GIS technologies: [1]

Creation of the analysis database to the user in the format he wants (Tsihrintzis et al., 1996);

Creation and use of agricultural and hydrological models (Hu et al., 2001);

Creating Surface Water Models (Bastiaanssen et al., 2005);

Creating models of groundwater and surface water and their delivery systems (Zhang, 2005);

The depth of groundwater level and salinity of groundwater shows that the land reclamation condition worsened compared to 2013. At the beginning of the growing season (1 April), the area less than 2 meters was 168.38 thousand hectares or 59%. During the same period, groundwater salinity was 93.78 thousand hectares, or 32%, in the dense residue up to 3g / l (low salinity). At 118,11 thousand ha or 41% of the irrigated land, the depth of groundwater was at a critical point of more than 2 meters, of which 6.43 thousand or 2% of the irrigated land was up to 1 meter deep. Groundwater salinity was more than 3 g / l (weak, medium and highly saline) at 192,71 thousand, or 67%. The groundwater depth of fewer than 2 meters was reduced to 20.84 thousand hectares, and salinity increased (by more than 3 g / liter) to 18.51 thousand.

Table 1

About categories of soil salinization in Havas district farms Asof 2015-2018 Information						
The name of the farm`s	Years	Totalirrigated - area, ha	Categorie sof soil salinization%			
			notsalinization are a ha	less salinization area ha	on average salinization area ha	strongsalinizationarea, ha
1	*2*	*3*	*4*	*5*	*6*	*7*
Farhad	2014	5181	191	4649	305	36
	2015	5174	48	4391	660	75
Shirin	2014	418		274	144	
	2015	418		242	176	
Xavasa-bad	2014	1231		1207	7	17
	2015	1230		692	453	85
A.Temur	2014	3135		2198	937	
	2015	3135	158	2302	639	36
Chashma	2014	1459	34	1273	152	
	2015	1459	76	1262	121	
Turkistan	2014	1145		1113	32	
	2015	1147		870	267	10
Bobur	2014	1933	127	1806		
	2015	1919	20	1519	341	39
Mustakil-lik	2014	4691		4359	332	
	2015	4691	36	4500	155	
Yangier	2014	3866	45	2462	932	427
	2015	3867	145	2703	602	417
Pahkta-kor	2014	5105	616	4160	329	
	2015	5104	886	3614	582	22
Khamza	2014	4286	123	2872	958	333
	2015	4277	131	2860	1154	132
Norchaev	2014	4353	60	3813	480	
	2015	4335	89	3328	801	117
Kaharrov	2014	1887	22	1214	501	150
	2015	1879	7	1169	570	133
Byarea:	**2014**	**38690**	**1218**	**31400**	**5109**	**963**
	2015	**38635**	**1596**	**29452**	**6521**	**1066**

At the end of the growing season (October 1) the depth of groundwater less than 2 meters increased the area by 15.78 thousand hectares, with salinity (up to 3 g / liter) reduced by 7.0 thousand hectares.

The dynamics of groundwater salinity continued to change throughout the year. In addition, the above salts also dissolve as a result of precipitation. When the surface water drops, some of the salts pass into the soil and the groundwater is depleted.

Result. Many scientists have created SEBAL models to control the irrigation in the Khorezm region and Fergana valley in central Asia. Here SEBAL models are used with MODIS images (Chemin et al., 2004; Bohovic, 2009; Awan et al., 2011; Bohovic et al, 2012; Awan, 2015). Especially, scientific research of Conrad is very important in this field. He created the SEBAL model using images of RS, MODIS, ASTER, SPOT-5 and other satellites for the Amudarya basin and calculated the fertility of utilizing water. Besides, he created several hydrologic models for the very area by using GIS (Christopher Conrad, 2006; Christopher Conrad et al., 2007; Christopher Conrad et al., 2010; C. Conrad et al., 2013).

The use of GIS in agriculture, irrigation networks, and meliorative hydro geological monitoring of irrigated land has a high potential for monitoring the use of irrigation networks and agricultural land (Tsihrintzis et al., 1996). The following features and equipment make GIS the most important program in agriculture (Zhang, 2005)

Spatial analysis, 3D operations, Network layers, Short way to summarize, Simple data reception, Accessibility options, Duration of the process.

Conclusion. Introduction of GIS in some arid regions and improve water resource management by this system can be an innovation for some regions. But, GIS is just software and for processing and obtaining solutions one needs to collect data and enter results of analysis, then this program becomes a useful data source for us. Data collection and entering it into GIS are also highly diversified and based on many selections. There are many ways and methods to collect data. Consequently, the types of data are numerous. Filling GIS with unnecessary information causes the user to be lost in a huge information mess. Therefore, it is very essential in research to get only necessary data and choose proper analysis software for it.

There are 286,500 hectares of irrigated land in the region controlled by the Syrdarya Amelioration Expedition. Thus, as of October 1, 2017, the soil samples were analyzed by the Dynamic Chemical Experts at a constant dynamic point, and the amount of chlorine ion was determined by the amount of silver nitrate and by the X-express and conductor apparatus. Soil samples were taken from layers 0-0.3 m, 0.3-0.7 m, 0.7-1.0 m. [3]

According to the results, as of October 1, 2017, the area of 7059 saline areas, 223727 low salinity, 50222 moderately saline, and 5486 strong saline areas were identified. The area under saline decreased by 616 hectares compared to 2013, the area of low salinity decreased by 1,036 hectares, the average saline area increased by 211 hectares, and the saline area increased by 1,441 hectares.

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