



Regional Aspects of Sustainable Water Use in Bukhara Province

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Abstract

The analysis is based on geographic and climatic data, focusing on the province's relief, desert areas, and seasonal temperature variations, as well as precipitation indicators. The southeastern part of the province lies within the Zarafshan Valley, while the majority of the territory is desert. The climate is extremely continental: summers are hot and dry, with average temperatures ranging from 28–32 °C in July (reaching 60–70 °C in sandy areas), while winters are cold, with temperatures from 0 °C to –12 °C in January. Annual precipitation is limited to 90–150 mm, which significantly restricts natural water availability. The combination of desert landscapes, extreme temperature fluctuations, and scarce precipitation creates challenges for sustainable land and water use. These natural conditions make irrigation and effective water resource management crucial for the province's agricultural and economic development.

Keywords: relief, erosion population, poverty, employment, pandemic, entrepreneurship, low provided, population share, cost.

INTRODUCTION

Bukhara in the province from water effective of use territorial aspects many to factors related, including climate, economic activities, population water to resources was need and natural conditions. Below Bukhara in the province from water effective of use main territorial aspects quoted:

Bukhara province Uzbekistan southwest in part located is the region's climate dry and hot. Summer average temperature around 35–40°C is, this on the ground of water decomposition and evaporation very high. Therefore for, from water effective use for water saving and storage technologies big attention focus need.

Bukhara in the province water sources mainly rivers, wells and artificial water from the warehouses consists of. The most important water from sources one Amu Darya and his/her row tributaries It is also considered the capital of Bukhara. farming networks for artificial irrigation systems are also very important.

Bukhara in the province main economic activity village farm cotton, grain, vegetables and fruits is cultivated. Such intensive village farm in networks water optimal allocation of resources very important. Water saving, drainage systems modernization to do and drip irrigation technologies current to grow this regarding big importance has.

Bukhara in the province from water effective use for one row innovative technologies is being used. Example for, drip irrigation systems, water again work and cleaning methods, and water saving for special devices current These technologies are being using irrigation efficiency increasing and water expense is decreasing.

From water effective in use ecological aspects are also important role plays. Water quality and amount to ecosystems impact Bukhara in the province natural resources preservation and ecological balance storage for water to save separately attention focus need [1].

Bukhara in the province water effective management for market mechanisms current It is also important to water. resources in distribution economic incentives create, water to save encouragement and from water of use market based on management done increase possible [2].

METHODS

The analysis is based on geographic and climatic data, focusing on the province's relief, desert areas, and seasonal temperature variations, as well as precipitation indicators.

RESULTS

Bukhara in the province from water effective of use territorial aspects natural resources and economic activities with closely related

1. Water resources territorial distribution

Bukhara of the province main water source Amu- Bukhara car This channel is From the Amu Darya water take, Kyzylkum from the desert passing by, Bukhara to the oasis The channel delivers general It is 400 km long and has water transfer power maximum 270 m³/ s organization does [3]. With this together, Kuyumozor, Tu' dako'l and Shorkul water the warehouses are also being irrigated. important role plays. But the water resources province along uneven distributed:

- Southeast regions (Zerafshan valley): Here oasis conditions there is irrigated farming developed. Amu- Bukhara channel water mainly this to the area is redirected.
- North and western areas (Kyzylkum) desert): In these areas water shortage sharp noticeable and mainly pasture livestock for Water is used. sources shortage because of from the lands effective use limited.

2. Irrigation territorial aspects

Bukhara in the province village agriculture, especially cotton farming and vegetable growing to the water related. Amu- Bukhara channel to work unloading with 136.5-thousand-hectare land Amu Darya water with watered started, as well as 23.8-thousand-hectare new lands mastery opportunity appearance However, the regional differences irrigation to the efficiency impact does:

- Oasis zones:Here water economical irrigation methods (e.g., drip irrigation (current) is being done, but many in cases traditional irrigation methods (torrent water) is used, which of water big part to lose take is coming.
- Desert Regions:Water warehouses and channels desert to the regions arrived it won't work, that's why for this on the ground water storage and from it use opportunities limited.
- from water effective in use problems
- Water Losses:Channels and irrigation networks obsolescence because of of water big part evaporated or land under absorbed goes.
- Water warehouses expansion:Desert in the regions small water warehouses build through water storage and livestock needs for use opportunity appearance will be.
- Infrastructure update:Amu- Bukhara channel and other irrigation networks modernization to do water their losses reduce.

Bukhara in the province from water effective of use territorial aspects oasis and desert regions between to differences is based on. Oasis zones irrigated farming for Although it is rich in water, the desert regions water from shortage suffering smokes [4].

Uzbekistan Republic territory Central Asia coastal to the zone 70 % of the area desert and little deserts occupied by Uzbekistan Republic of natural geographical location according to two big desert Kyzylkum and Karakum to the oasis stretched. Of water shortage of the country characteristic feature is considered. In the country of water main part watering can to farming right comes. In the Republic in use total water 20 percent of its resource's country inside the remaining 80 percent and neighbor Tajikistan and Kyrgyzstan in the territory is formed [5].

Bukhara province Republic southern West of Zarafshan of the river lower and middle in part located is, northwest from the side partially Amu Darya with Turkmenistan Republic, from the southeast Kashkadarya region, from the northwest Navoi region, from the northeast Khorezm and Karakalpakstan Republic with the province is limited. general land area 4 million 200 thousand per hectare consists of irrigated area 274.60 thousand hectares, of which 20,909 hectares (0.5%) are gardens, 2,674,186 hectares (63.77%) are pastures, 205,616 hectares (4.9%) are forests and 1002295 hectares (23.9%) other land fields organization does, the remaining 6.9 percent land fields abandoned are lands.



Figure 1. Bukhara province of the district's geographical map [6]

Bukhara province internal to the basin incoming from countries is subtropical and moderate climate regions northern on the border located in the area geographical in terms of such to be climate to the formation impact shows. In general Bukhara province climate in the summer dry tropical air masses under the influence of, in winter and from the north moderate from the latitudes coming cool air masses impact under Geological point of view from the point of view territory saddle-shaped in the structure located and 400 meters thick enough continental beds with filled. They everyone on the ground wide widespread Paleogene of the era clay on lies in the Paleogene. period clays, below located chalk sandstones period for water transfer layer task does, layer wetness with difference does and pressure under the influence land on the face himself/herself flowing comes out. Contents sulfate, mineralization 2-3 g/l organization does [7].

In our republic mineralized from the waters use amount of the year water with provision to the level directly related Bukhara in the province irrigated lands reclamation status in improvement collector-poacher without networks imagination arrived It will not be. These goals for province according to current on the day general with a length of 8851.60 km collector-poacher networks village farm and usable lands for service does.



Figure 2. Water resource's location map [8]

Interdistrict Central Bukhara collector - Bukhara in the province built the largest hydraulics from the buildings is one. In 1955 Central-Bukhara collector Vobkent from the district Zarafshan of the river old my name the place from the hydraulic unit Mokhankul to the collector was his/her self-deepened, expanded to work Central Bukhara of the grave It is 95.1 km long and has water transfer capacity 80 m³/s organization does [9, 11].

Central Bukhara to the collector Bukhara, Jondor, Vobkent and Romitan districts in the area collector-drainage in networks collectible size waters the collector general water assembly area 64.6 thousand to. Central-Bukhara to the grave 80 ha in the region close farm internal and inter-farm collector waters Central - Bukhara sewer 1200 hectares in the region to the field service does. Central Bukhara sewer of water from the composition results when taken the following determined.

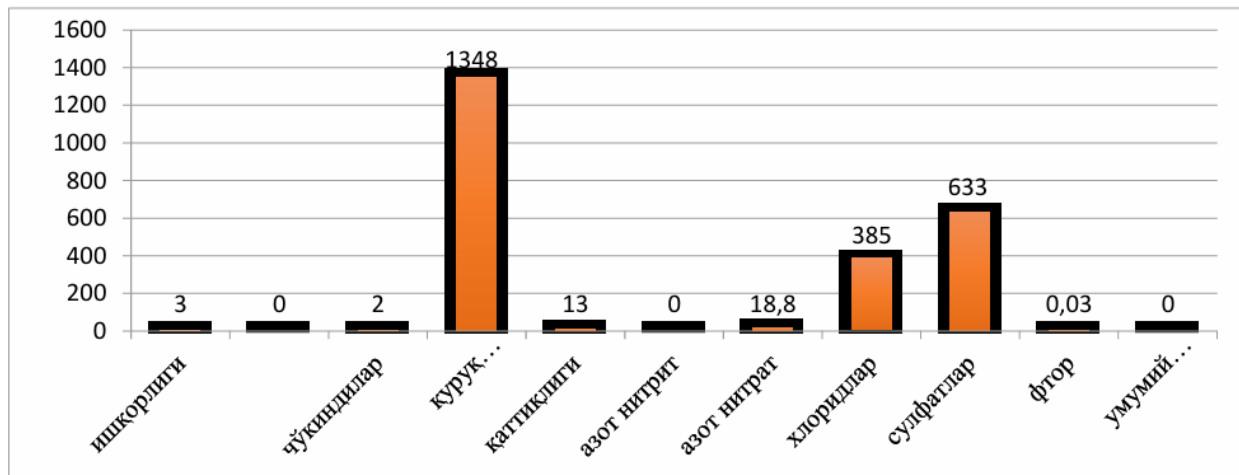


Figure 3. Central Bukhara ditch of water analysis results ^[10]

Central Bukhara from the ditch flowing passing by of water in the content turbidity 1 liter 2 milligrams in water organization will be. Central Bukhara sewer of water alkalinity 3.0 milligrams divided into 1 liter in the water dry residue 1348.0 mg/dm³, total hardness 13.0 mg/dm³, nitrogen nitrite 18.8 mg/dm³, chlorides 385.0 mg/dm³, sulfates 633.0 mg/dm³, fluorine and 0.003 mg/ dm³ organization Water in the composition nitrogen ammonium amount not observed. Local to substances typical was special substances (phosphate, copper, lead, zinc) such as substances amount Central Bukhara of the grave water in the composition not detected [11, 12, 13].

North interdistrict ditch in 1948 to work the length is 139.9 km, the water transfer ability and 56.5 m³/ s organization does. North interdistrict collector in the province Gijduvan, Shofirkan, Romitan, Peshku and Vobkent in the districts crop in the fields harvest to be size the waters take out goes. North ditch from water taken results following elements determined.

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