

The Peculiarities of Development of Farming Culture in Central Asia.

Yunusova Khurshida Erkinovna¹, Kholikulov Akhmadjon Boymakhmatovich, Usarov Umidjan Abdumavlyanovich, Akramova Fazilat Ortikovna

Annotation. *In Central Asia, where the climate is extremely mild and droughty, with hot summers, no clouds, and the winter is cold and frost-free, agriculture has a long history. The local people have extensive experience in crop rotation, using the land effectively, planting crops such as wheat, barley, rice, sorghum, cotton, legumes and vegetables, up to four times a year. With spring's arrival in February, farming began in March in the south of the region and in April in the north. The rapid melting of snow and the warming of the ground by March also allowed high yields to plow and prepare for farming. In the spring, it was raining more than autumn and lasting until May. In recent months, the rainy season has begun with low rainfall. Among crops, wheat and barley are sown with cereals on dry land. On irrigated lands rice, corn, millet, legumes (moss, beans) are planted. In addition, there is growing horticulture and viticulture, planting vegetables and melons. The alfalfa and other feed crops needed for livestock are also planted too much. Farmers pay special attention to the damaging factors. They knew that the strong wind and the gale were very windy, and they planted cotton that was well watered and not affected by the wind. They have planted more trees to maintain regular land reclamation. In Central Asia, based on irrigated agriculture, the local population has been using water efficiently. Farmers used their own "traditional" methods to pump water through irrigation canals and irrigation ditches, and built irrigation systems from ancient times, and they built fast and inexpensive irrigation systems using simple materials such as soil, turf, stone, horns. Syrdarya, Amudarya, Chirchik, Naryn, Karadarya, Akhangaran, Zarafshan, Kashkadarya.*

Key words :Moderate, arid, rainy, crop rotation, natural fertility, rain-fed soil, cotton, needle, irrigation facilities, irrigation, dam, "pit", well, Chirchik, Naryn, Karadarya, Ahangaran, Zarafshan, , turf, gravel, plowing, weeding, Karakul, Bozor Kurgansay, Esipastsay, Podshoota, Soh, Uchkurgansay, Shohimardonsay, Isfara, Akborgi, Arvohsoy, Kirgizia, ditch.

I. INTRODUCTION

Throughout the long history of the revolution, Central Asia has a unique school of culture and agriculture, with its climate extremely mild and arid, with a hot and cloudless summer, and a cold and frost-free winter. The people of Central Asia, using their land efficiently, planted crops such as wheat, barley, rice, corn, cotton, legumes and vegetables and were able to get up to four times a year. The population has extensive experience in crop rotation. This method has played an important role in restoring the natural fertility of soil and improving its soil composition, as well as in the fight against plant diseases. Several sorts of plants were planted on the cultivated fields and were replaced after a certain period of time.

The climate of Central Asia is unique. Spring begins in February, and in the mountainous areas it arrives late, because of the heavy rains and the warming of the plants the plants wake up quickly and bloom. In Central Asia, flowering of trees

¹ professor of the history of Uzbekistan department, National University of Uzbekistan
the professor of the history of Uzbekistan department, National University of Uzbekistan
the doctoral student of the history of Uzbekistan" department, National University of Uzbekistan
the teacher of the history of Uzbekistan department, National University of Uzbekistan

began in February, and in late February trees such as silver poplar, birch, almond start to bloom, in march, apricot, plum, pear, apple, cherry bloom. Spring is short, warm in April, and summer begins in May. Farming begins in March in the south of Central Asia and in April in the north. Among the crops cultivated in Central Asia, wheat and barley are the main crops grown mainly on rain-fed lands. On irrigated lands rice, corn, millet, legumes (moss, beans) are planted. Rural populations satisfy their needs and have exported some of their produce to neighboring, non-grazing lands. In exchange for this there are livestock products. In second place were gardening and viticulture. Some of these products are mainly dried (peanuts, raisins).

The second place was occupied by horticulture and viticulture. Some of the products of horticulture and viticulture were exported mainly for dried fruits (peanuts, raisins). The third place was occupied by vegetables and field products. In the fourth place were the alfalfa and other feed crops needed for livestock, and finally, the fifth place was cotton. It is known as local cotton (cotton) and was grown mainly for domestic needs. It was not an administrative organization for the cultivation of crops or for maintenance and irrigation. Local people produced products based on market needs and according to the established local rules, irrigated the crops and harvested the crop. Water has always been important in agricultural production in Central Asia. For this reason, the local population has been paying special attention to waterfowl. Farmers have long been able to solve complex technical problems in constructing irrigation facilities, ranging from the correctness of the slope that provides water flow to irrigation canals, and the construction of dams, taking into account the water pressure and the downfall forces. They used simple materials such as soil, turf, stone, horns, and waterproof brick for construction of engineering structures made of stone or sturdy bricks. As a result, Uzbekistan has developed a unique irrigation technique, which has accumulated great experience in the construction of various water structures since ancient times. There were ancient water structures erected in low-lying areas of Samarkand, Bukhara, Jizzakh, Surkhandarya and Syrdarya regions. Local farmers have made effective use of fast and inexpensive irrigation systems using soil, stone, wood, cane, horn and other materials. However, blocking the waterways that have been blocked by such roads has not been long enough to block such materials. Therefore, farmers have been engaged in construction, repair, and cleaning works on the irrigation networks for at least 10-20 days by hashar (general group workin process) almost all year. Since most irrigated areas are above water level in the river, canals starting from the rivers usually work only during floods and bring water to the fields. At other times of the year, the canals were dry or water scarce. At this time various facilities were used to pump water from the river. One such facility is known as a pit, which is widely used for the irrigation of water from rivers, canals and even wells.

The Aral Sea, which plays an important role in agricultural development in Central Asia, is one of the largest freshwater and salt water lakes in the desert region of the globe. The Aral Sea receives water mainly from the Amudarya and Syrdarya rivers. The sun ray which is equal to 7 billion tons of conventional fuel is exposed to sea level every year. About 40% of the sun's rays are absorbed by seawater, creating a favorable warm climate for large-scale agriculture. There are two rivers flowing into the Aral Sea, one of which is the downstream of the Amu Darya and its delta in the Khorezm oasis and irrigated lands on the border of Karakalpakstan. The second river in the upper reaches of the Syrdarya river basin is the river Chirchik, Naryn, Karadarya and Ahangaran. About 6-7% of these rivers was used for irrigation purposes. Water from rivers such as Zarafshan and Kashkadarya that flow through densely populated areas was also used for agriculture[1]. The water resources of these rivers fluctuate depending on the seasons and the weather, especially during the winter and spring months. There were also years of water shortage. In this case, local farmers used their experience and knowledge. Farmers and mirages foresaw that there would be little or no water in the river, depending on the nature and environment. This experience allowed them to increase or reduce irrigated cropland. Farmers built large reservoirs to block the river and build up dams and conserve excess water, and knew how to use water resources to the end[2]. This

method is environmentally sound, including groundwater infiltration into the bottom and bottom of reservoirs, which often worsens the ecology of the lower reaches - preventing the rise of groundwater levels, swamps, and soil salinization.

Every person of valley, oasis in the Central Asian region knew how to use water, depending on the location of the land, for farming. For example, the Zarafshan River, which is several times smaller and more quiet than the large water sources in Central Asia, was easily accessible by locals and was effectively used in agriculture for its breadth, depth and flow rate. For example, about 400,000 hectares of land are irrigated through ditches from one of the largest water networks, the Zarafshan River. Zarafshan residents were more involved in streamlining river flow and timely linking water to irrigation systems. Water discharges into the canals were carried out by installing dams on the river. The people of the Zarafshan Valley have used this method since ancient times. Dams, built by farmers on the main channel of the canal, and the locals say "varaq", "varq" or "band", are made of natural materials, that was, horns, cane, hay, stone, gravel, grass and soil. The dams are built differently depending on the length of each waterway. For example, there were simple structures built up to a certain part of the stream, not reaching the opposite bank of the river. Such structures are called "slope", "nishband" or "nishwand" in the oasis of Samarkand and Bukhara. It was easier and more convenient to install stairs and to regulate the water that can be attached to canals. The dam was stretched when it was necessary to increase the amount of water coming into the canal. Reduced when needed. This simple design of stairs shows that it was a product of ancient times. The second type of river was a closed dam adjacent to either bank of the river, which was called a "dam." This dam was also built very simple, for which two thick piles were stuck on both sides of the river. The lower part of the tree was suppressed by horns, weeds and other things. They were often dense. The horn was suppressed again. Depending on the depth of the river, this process was repeated 3-4 times, sometimes even more. Such dams in Bukhara region were known as the "people" and did not reach the other side of the river. Such a method of river closure not only broke the flow rate and facilitated construction, but also kept the water from swallowing the dam and kept it stable for a long time. Local irrigators have paid special attention to the installation of bands, the corner adjacent to their banks. Because of the force flowing into the canal, the water in the corner of the dam collapsed and there was a collision.

In general, both types of dams - staircases and blinds - are almost identical in construction, and the ancient irrigators who discovered these structures found a way to master them against the flow. According to the academician A. Muhammadjonov, in the construction of the main dam used round cylinders 6 to 8 meters long and 1-2 meters in diameter. They are called "navala", "kawala". In Khorezm, it is called "navard", or "ward", and in the Fergana valley it is called "uluk", "Karabur" in Syrdarya. These cylinders were made of horns and reeds, cylinders were filled with stones, turf and gravel, and were fastened with three or four reeds in the horizon [3]. Despite their large size, the locals made these cylinders without tools and were also skillful at throwing them into the rivers [4]. Large rollers rolled over the river and threw them into the river one by one. The first row of cylinders was submerged in water and the rest of the cylinders were dumped consecutively. It was sometimes blown out on both sides of the river and continued until it was closed in the middle of the river. Local people paid particular attention to the better location of the cylinders. These facilities were considered to be very affordable and affordable for their time.

Farmers working on the Zarafshan River have worked hard and hard, despite the lack of water or more water. They even had extensive experience in farming on lowland lands. For example, it is a method of peasants' stabbing, which is widely used in the Konimekh, Zandana, Romitan, Khayrabad and Karakul districts of the Bukhara Emirate. Preparing the soil for "sticking", meaning "plowing", started from the early spring when the soil did not get enough moisture. In the salt-marsh areas, however, the work began even in the winter, and the washing of the soil was primarily given "soft" water if possible [5]. As spring enters, plowing begins. The land was plowed one by one and it was divided into two parts. First, plowing continued until the end of June. With the entry of the summer chill, the plowing was temporarily suspended and

the plowed field was abandoned for forty days. Local farmers called it "lolabbi shudgor." During this period, the pests of the soil plowed by the intense sunshine and the hot summer temperatures have almost withered away. The second plowing began in August and continued until September. In both cases, the land was plowed 6-7 times[6].

In September plowing has begun on arable land. Bricks were also divided into three stages. At first, the plow was used 8–10 times long and transverse, with special gears. Farmers in Bukhara have called it "chipirost". Cereals were used for grinding of the plowing slices. The land plowed many times over and over and over and over again, eventually turned into fine soil like dust. At the same time, the main process of preparing the soil for "sticking" has been completed. Usually peasants threw the pieces up and plowed into the plow to determine if they were getting ready for the crunch. If the plow fell into the soil and buried it, it was considered that the land was formed at that time. If such a plow is taken, a person's feet are damp to the ground. Before sowing, the soil is pressed a second time, reaching 6-8 times. After sowing the seeds are pressed with 2-3 threads. The agro-agrarian action, which lasted for almost six months, ended.

Such careful cultivation of sown areas allowed to provide moisture due to winter and spring rains. This is because the soil, which has been converted into fine particles as a result of repeated cultivation, is compacted by the heavy impact of the mole, preventing excessive shine and keeping moisture for a long time. As a result, the sprouts sown in autumn sprouted in the autumn and grew normal in spring, without the beginning of the hot summer temperatures and the need to water the soil until it sprouted and frosted, and it yielded little fruit. Wheat and barley were sown mainly in such areas. For this reason, the land that was planted in the "stump" was called by local farmers "soli" or "annual". The method of "sticking" is most commonly used in Karakul[7].

The Khorezm oasis is an oasis with an ancient farming culture, the main crop is arable farming here. More than half of arable land is allocated for wheat, corn, and about a fifth for planting cotton. The rest of the land was distributed almost equally, with barley, rice, flax, sesame, melon and watermelon. Although horticulture plays little role in the farm, the fruits of apricots, peaches, grapes, apples, pomegranates and pears were planted in the Khiva gardens.

In agriculture, the plow was the main weapon. Working animals consisted of oxen or horses. Harvesting and storage in Khorezm agriculture was not the main problem. In the oasis, the water shortage was severe and the land along the Amu Darya was always plundered. The further the river became, the less developed the area was. In Khorezm, there were two methods of irrigation of lands, with the use of deep and non-stick irrigation. On irrigated lands, water was discharged through streams. The ditch water ran down the slope. On the irrigated lands, a water wheel was first laid in the middle of the river. It was driven by oxen or horses rather than by ditches, and smaller particles made people move by themselves. M.Y.Yuldashev wrote that in Khorezm the huge amount of money was required to repair the irrigation facilities and build new ones, and to build large irrigation systems. Only the state could do it. Therefore, the more stable the state power in the Khiva khanate, the more the irrigation was built and the more land used[8].

Farmers of the Khorezm oasis tried to find out when the Amu Darya floods. Even those who knew the flood would have a great reputation. According to Y.Gulyamov, people in Khorezm have been able to make a flood calendar in one way or another. The first flood on this calendar was called "the sound Forty Reeds." It started when the reeds on the floodplain islands and lakes were just beginning to grow. This happened on the twentieth of March, when local farmers learned that the flood was timely or delayed due to the rapid or slow growth of the cane. The second flood was called the "white fish." It was mid-April when white fish in the Aral Sea swam upstream into the Amu Darya. The third was called "The Sound of Stars," and it was in mid-May. This flood was timed to be seen by the Hulkar constellation. The fourth flood was "forty still days" (forty days reservoir), which began in the second half of June and continued through early August [9].

The most difficult task for Khorezm farmers was to choose a suitable site for the construction of a canal head to prevent flooding. Due to the unstable soil, often the head of the canal was enlarged by the strength of flood waters. The channel could quickly become a river that no one could control, no one to look at. Therefore, as the stream flows its course during floods, they have sought to use permanent and moderate flow of water. The channels are often opened in several places. As a result, they have become weak and controllable streams. When there was no flood, the peasants tried to use every possible way to get water.

The Fergana Valley, which has been developed for agriculture, geographical and climatic conditions, was also an important agricultural region in Central Asia. Farming, cattle breeding, gardening developed in Ferghana, and farmers in Fergana were rightly known as laborers who mastered the secrets of farming. Soon after the Khorezm and Zarafshan oases, the center for the construction of hydraulic structures will move to the Ferghana Valley. In order to improve the water supply in the area, to increase the handicraft networks and to provide the population with drinking water, dams in the foothills and on the slopes were built. The largest river in the region is the Syrdarya, which consists of the confluence of the Naryn and the Black rivers. The Naryn River originated from the Tyanshan Mountains and contained several sr networks along the way. It is 40 km. After a distance, in the village of Mingbulak it merges with the Kara-Darya . In the Fergana valley from the Syrdarya, such channels as Uchkurgan, Kyzyl-Bulk, Tuti, Kayka I, Kayka II, Khakilabad, Yangiaryk, Karaskon, Rustamogalik, Kumton, Zarbob, Davlatboy, Nazaruzdikhon, Jedakenin. On the right and left bank of the Black Sea, there are ditches called Shahrihonsoy, Andijonsay, Ulugnor, Chek, Nasreddinbek, Kokand village, Sazi, Khairobad. In addition, there were ditches of Kgarsay, Bozor Kurgansay, Esipastsay, Podshoota, Soh, Uchkurgansay, Shohmardonsoy, Isfara, Akborgi, Arvohsoy, Kirgizia ditches that flow directly from the mountains into the valley villages. Naturally, these rivers have created favorable conditions for farming in the valley. By the beginning of the 20th century, there were 36 irrigation systems in the Ferghana Valley, while such networks as Isfara, Soh, Sary-Kurgan, Avgon, Voh, Kara-Kurjin and Ak-Kurgan provided water for only one of the villages around Kokand. Shakhimardon, Ulugnor canals such as Shakhimardan, Tara, Karakulja, Yugi Kugart, Chapkent, Kara - Ungara, Sheydon, Mayli-Uzboskan, provided the region of Andijan with the wtare, Podshoota, Kyzylota, Olabuka, Ashcha, Khrutk, Chokar watered the landof the Namangan region[10].

The first cold days in the valley started in October, October and November were months with high precipitation, and from December, the days cooled down, but never dropped below zero. These months, the snow has not melted too quickly and has been melted more quickly, with snow days melting and warming up to March, and plowing and preparing for farming have yielded higher yields. In the spring, it was raining more than in the autumn and lasting until May. In recent months, the rainy season has begun with low rainfall[11].

Farming started in early spring with clearing ditches. In the villages where canals have been established over the years, the population has always paid close attention to irrigation ditches, and the cleaning of the canals depends on the size of the irrigated land. Irrigation is being cleared, expanded, and cultivated.

The people of the Fergana Valley, depending on the composition of the soil, knew how to use it and were able to get sufficient yields. The available land in the valley was subdivided into irrigated "wetland" and non-irrigated "spring land", "back land" or "rainfed". The land was used in two ways. In the first one, rest was mainly given to the arable lands, and the second one was cultivated. Both methods have different names in different parts of the valley. For example, in the Soh district of Fergana valley, the land-use method is called "Dam dadan", and the land plowing method is called "black plow." The plowing work began with the arrival of the "Xamal" (month on the solar calendar, which runs from March 21 to April 21, according to the current lunar calendar)[12].

Farmers used their own "traditional" methods of producing water through irrigation canals and irrigation ditches. The river, which was separated from the river or the shore, is known by the local people as the "mother ditch", from which the water is drawn into the 'king ditch' and the water from this canal is given to the areas. From them they spread to the "furrows" through the "sheets". Thus, water is distributed to rural communities. This organizational method was called the "dividing" method in the valley.

During the years of water scarcity in the eastern districts of the valley, the "labgardon" method was used. According to this method, the head of the ditch was covered with wood or plank trunks so that water was evenly distributed. The top of the pillars in the mouth of the ditch was cut to allow a certain amount of water to flow through it. This method has been used to ensure that the water distribution of the two streams was in the same location, so that the water can be distributed equally and to facilitate measurement. As a result, water was strictly distributed. During the years of water shortage this was more strictly followed.

Farmers in the Ferghana Valley have also built melioration facilities. The structure, commonly referred to as "zovur", was common on all irrigated lands. Water from the ditch was used for irrigation when necessary. In the vicinity of the Fergana Valley, especially Kokand, the trenches were dug to a depth of 1-1.8 meters. The furrows mainly crossed the boundaries of each farmer's land, and if the plot was large, a ditch was laid in the middle. The presence of such fences clearly defined the boundaries of the site and cleared at least two neighboring farms. The drainage water was discharged into irrigation ditches, and there were no cases of salinization of the crops or decrease of yield.

The plots on where the "zovur"s built were washed away throughout the winter. The low saline soils were washed only one or two times, the heavily saline soils were up to 5-6 times, and some areas have not been washed away because of the winter, spring rainfall and watering before sowing. It was also used for drinking water from the ditch during the winter and spring seasons. These methods are suitable for washing the soil salts. A.F. Middendorf emphasized that farmers in the Valley were not afraid of excessive salt in the soil, they knew that salt itself could easily escape from the soil, and that the experience of the Ferghana Valley farmers should be studied in this regard. The author calls his contemporaries to study and apply the experience of the farmers of the Ferghana Valley. He particularly admired the intelligence of older people. Farmers from Fergana have developed many innovations in irrigation and land reclamation, and they were well-versed in fertilization to improve the agro technical condition of the land. Fertilization of fields continued from late fall to early spring. Such methods include the use of clay wall soils in old houses made of mud, the use of manure, silkworms known as "fecal" and various bird litter[13]. Another method used to increase the fertility of lands was the use of compasses on human hair, old skin, wool, and other products. According to A.Shahnazarov, in addition to farm manure, the locals used bird manure, mainly pigeon manure. The author writes that in this country, where there were a lot of pigeons, there were certain individuals collecting pigeon manure and selling the manure they had bought to strawberry growers. In addition, canals and sludge wastewater efficiently used. The ditch, which has been dumped after the canals have been cleaned, was gradually spread over the ditch and left for one year. During this period this decayed waste was used as a fertilizer in the field. In addition, the locals have been making good use of bones, sand and old wool. Woolen cloth had long been used in horticulture, although it was rotten. It was usually placed under fruit tree seedlings with woolen cloths to protect against butter beetles when planting fruit trees. It is now widely used throughout Turkestan [14].

Local people also pay special attention to the factors which were detrimental to agriculture. For example, there were severe wind and gale floods that could damage crops and cause drying of crops. Though winds were not every year, they were repeated several times a year. Garm-flood winds occurred in June, July and August, and locals believed that 10 to 15 minutes of wind would be enough to dry the crops. Gale - Flooding was started usually 5-6 hours at sunset. The well-watered Gale wind did not cause any damage to the cotton, which had the most impact on the rice. In fact, there have been

similar winds in various parts of Uzbekistan. According to Professor N.N. Romanov, K. Mirzajonov 63 times in Fergana Valley (Besharyk district), 16 times (Pop), 37 times (in Tamdy, Buzovboy), Bukhara region, 34 times (in Karakul), 30 times in Surkhandarya region(Kamashi), up to 16 times (Guzar), 19 times in Samarkand (Kushrabot), 7 times (Gallaorol), 4-5 times in Khorezm region (Khiva, Urgench), 30 times in Jizzakh (Khovos), 11 times in Syrdarya, (Yangier), 4-5 times in the Tashkent region (Qovunchi) and 46 times in the Republic of Karakalpakstan (Nukus) to 44 times (in Toxiyatosh). These dust storms bring the mountain to the vertical zone (light gray soils) and land on mountainous areas where the wind speed decreases. According to Professor B.A Federovich, high winds were blowing in other parts of the earth (the Arabs call them "Samum", "Khamsin", and in Uzbekistan "Afghanli" and "Kokandli") [15].

Farmers have taken every precaution to prevent such and such damages. For example, many trees have been planted in the Ferghana Valley since ancient times. They allowed for continuous monitoring of land reclamation. These deep-rooted plants have helped farmers with a significant reduction in groundwater. One hectare of trees was able to evaporate 10-20 thousand cubic meters of ground water or 1 liter of mulberry trees to 90 cubic meters per year. Especially important was the amelioration of mulberry trees and the intense evaporation of groundwater. The local population increased tree planting as the groundwater around the plantations was 40 to 60 cm below groundwater levels, resulting in a dramatic reduction in soil salinity [16].

In agrotechnical activities, tillage continued for a long time after harvest. After harvesting, the land was plowed and large margins were dug and abandoned until late autumn. By November the borders were full of water. This method was called "yahob" or "qavsob". For some crops, such as wheat, wool, cotton and other crops, the reclamation of the soil was used to improve soil moisture and reduce salt content. , which helped to reduce the salt content in the soil.

Farmers of the Ferghana Valley, who have extensive experience in farming techniques, have also persuaded to start planting. In this respect, the Ferghana Valley differs from other historical and cultural countries of Central Asia due to its natural geographical conditions, the fact that most of the population has lived a long way of life, as well as the diversity of their ethnicity.

In general, agriculture in the territory of Uzbekistan has a long history. It has a significant position in Central Asia due to a number of aspects, such as climatic stability of the country, abundance of water resources and favorable natural conditions for farming. Also, the population has a long history of development of agricultural culture. Undoubtedly, Uzbeks have developed their own culture related to agriculture, based on the thousands of years of experience and sensitive phenological observations. It is precisely because of this culture that the peasants combine ethno-cultural traditions and technologies in the field of natural resources, in particular, the rational use of land and water, and the production of hard labor.

II. REFERENCES:

1. Қодиров А. Ўзбекистон ирригацияси тарихидан лавҳалар (XIX аср ўрталаридан 1920 йилларгача) – Тошкент. Абдулла Қодирий номидаги Халқ мероси нашриёти, 1998. -14 бет.
2. Ирригация Узбекистана – Ташкент. Фан, 1975. Т.1. – С.56.
3. Муҳаммаджонов А. Зарафшон воҳасининг суғорилиш тарихи. -286 бет
4. Гелман Х.В. Особенности работ в строительных материалов Туркестанского края. – С.50.
5. Йўлдошев М.Хива хонлигида феодали ер эгаллиги ва давлат тузилиши.- Тошкент. Ўзбекистон ССР Давлат нашриёти, 1959. – 81 бет
6. Фуломов Я.Ф. Хоразмнинг суғорилиш тарихи. – Тошкент. Ўзбекистон ССР Фанлар Академияси нашриёти, 1959. - 249 бет.

7. Леонов Н.И. Дарёларимиз ўтмишидан.-Тошкент.Фан, 1968. – 46 бет
8. Азимов Ш. Жамият тараққиёти ва сув муаммоси // Иқтисод ва ҳисобот. 1995. -№2, - 32 бет.
9. Khurshida Yunusova, Umid O'sarov Some judgments about the history of agricultural culture in Central Asia // International journal of Gurrent Research. Vol.10, Issue 08, August, 2018. Scientific Journal impact Factor 2017. -73121.
10. Исҳоқов З. Фарғона водийси анъанавий деҳқончилик маданияти. -Тошкент. “YANGI NASHR”, 2011.-74 б
11. Шахназаров А.И. Сельское хозяйство в Туркестанском крае. –СПб.: 1908, –С.61
12. Мусаев Н. Ўрта Осиёда деҳқончилик маданияти ва аграр муносабатлар тарихидан (Тош даври охирларидан XX аср бошларига қадар) Тошкент.,Фан, 2005.Б-193
13. Комилов О. Ўзбекистон суғориш тизими ривожланиши ютуқ , муаммо ва оқибатлар (1951-1990)Тошкент-2016.
14. Коржавин Б Д Орошение в Ўзбекистане. Ташкент – 1976