

Environmental policy and the environmental situation in the countries of Central Asia

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Abstract. Sharing the land in today's day to the unprecedented level of change in the environmental situation are some of the global problems of humanity. Ensure environmental sustainability of the world community in this process, men the opportunity to live in a natural environment to create a comfortable, In the years of independence, important measures regarding the analysis of the environmental situation and environmental policy began to be implemented in the countries of Central Asia . A number of the world's scientific research and environmental protection are related to various aspects of the environmental situation in the research center. In this research, the shift of the ozone layer, pollution of the oceans of the world, in the loss of the fertile layer of the soil go, be cut out of a tropical forest, desertification, reduction of fresh water sources and biodiversity, the increase of household waste, chemical and neutralization of toxic substances, such as for the study of issues such as the environmental crisis. In this article analyzed ecological policy Central Asian republics in the years of independence.

1 Introduction

The people of Central Asia have studied the weather in the region since ancient times. This study was mainly done by observation. In particular, people who have knowledge in the fields of astronomy and geography have conducted their own research on this. Some of these scholars have written books on the subject. Also, ordinary people themselves monitored the weather conditions. Because they needed this information in their daily life. Before doing farming and animal husbandry, people wanted to know the weather information. For example, herders monitored the weather conditions in advance to prevent their animals from getting trapped in cold weather or dying in sandstorms. Farmers had to know the local weather well in order to plant crops.

2 Materials and methods

In the periodical press, information was given about the natural disasters that happened in Central Asia. Today, the study of these materials is of great importance. For example, in

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one of the 1885 issues of the newspaper "Turkestanskije vedomosti" there was information about the natural disaster in Namangan district. According to him, the spring months of 1885 in Namangan district were colder than other years. It's more like winter than spring. Even on the morning of March 14, it snowed and it continued until the evening. As a result, the snow had a negative effect on all budding trees and crops. By this time, the apricot trees had already blossomed, and because of this, the harvest of this fruit was greatly damaged. In addition, residents could not do their farming and other work due to the unseasonably cold days.

In addition, the summer season of this year also passed with some weather inconveniences. In particular, the summer season was very hot. On the other hand, sometimes there were sandstorms in the cities, and sometimes it rained. The storm happened mostly in the first half of June. The difference between this storm and the storms of other years is that it lasted for several days and the air turned yellow every morning. As a result, thick dust covered the furniture and various things of the residents standing in the yards. The wind spread these sands to different places. On some days it rained in the evening and this rain washed the sand off the trees. However, the belongings of residents in the yard were damaged [1].

In the history of Central Asia, there have been cases of death of livestock or failure to harvest crops due to unfavorable weather. Several sources provide us with information about this. For example, in January-February 1891 there was a cold winter in Central Asia. In particular, there was a lot of snow and the weather was cold. This is especially strongly felt in desert areas. As a result, breeders faced many problems in getting their cattle out of winter. For example, during this period, cattle breeders of Kazalinsk uезд of Syrdarya region grazed their cattle in the border areas of Kyzylkum with Bukhara Emirate. In particular, they were wintering in the area called Sir and Kuvan. As a result of this snow and cold, many sheep and cattle of cattle farmers died. As a result, the herdsmen decided to move from Kyzylkum to the Syrdarya River [2]. During this period, it was dangerous for herders and livestock. Because it is during this period that cattle begin to lamb.

Historical sources show that the population suffered losses as a result of insufficient rainfall in Central Asia. In the fall of 1891, several areas of the Syrdarya region were barren. In particular, the wheat harvest was very low. This crop failure occurred due to lack of rain [3]. This crop failure in the winter of 1892 had an economic impact on the native and transplanted population of the district. As a result, the starving population went to the city of Kazalinsk and asked for financial assistance from the colonial administration [4]. During this period, the price of bread in Kazalinsk uезд doubled and the price of a pound of bread was 2 rubles 50 kopecks [5]. In Kazalinsk district itself, even when the harvest was good, it was not enough to feed the population. This year, as a result of the lack of rain, the yield has decreased by 50 percent. This indicated that an additional 200-250 thousand pounds of bread were needed to provide the population with bread products that year [6].

From the above information, it can be seen that the unfavorable and unusual weather in Central Asia caused great economic damage to the population and the state. In this period, the best way to prevent this is to know the weather forecast in advance. In the early years of the Russian Empire's arrival in Central Asia, it used the local population's weather observation work. Therefore, at the end of the 19th - beginning of the 20th century, people's methods of observing weather data were studied by representatives of the colonial administration. Some of them have published their thoughts on their research in the form of books, while others have submitted articles to periodicals. One of them will be Georgy Arandarenko [7]. Arandarenko G. Publishes an article on meteorology concepts of the population of Central Asia. In the article, the author says that the local population lacks knowledge and experience in meteorological observations. In particular, he blames the public for not knowing how normal rain occurs and about clouds. He writes that people

cannot describe clouds and measure air temperature. Also, Arandarenko notes that the population's perception of existence was different. According to his interpretation, the population understood existence as consisting of the earth, the sun, the moon, and the sky consisting of large and small stars. People also imagined that the earth is twice the size of the sun and the moon is one and a half times smaller. He interpreted the earth as consisting of land and water. Also, Arandarenko recorded how natural phenomena and natural disasters occur. According to his information, the inhabitants understood that the earthquake was carried out by angels (angels) on the command of God, but thunder and lightning were caused by the collision of clouds with each other. He goes on to note that the population does not have information on how hail and hailstones occur[8]. From these descriptions, it can be seen that Arandarenko explained the views of ordinary people on the weather, not local experts. Therefore, in our opinion, it has not been able to provide accurate information about the local weather observation method.

However, by the middle of the article Arandarenko G. begins to deny these accusations against the local population. In particular, he notes that some residents have books such as "Ilm-i Hikmat" and "Kitab-i Nujum" (astronomy) and that the residents use the knowledge in these books to collect weather data. In particular, many educated people, presidents and judges had such books. In fact, it has already been proven that at that time, learned people in Central Asia had knowledge in the field of metrology[9].

Arandarenko continues to share the information he has gathered on how local people identify natural phenomena and how to deal with natural disasters. According to him, in every city, in every large village and village, there were specialists who combined the sciences of meteorology and astronomy - khisapdan (in settled areas) and isapchi (in nomadic areas). They provided weather information to the public. Each group of the population came to these specialists asking for the necessary meteorological information. For example, cattle breeders have been interested in how the coming winter will come to Isapchi. If it gets colder, the herdsmen should take measures to protect their livestock. In addition, these specialists had to determine the dates of the month of Ramadan and Eid al-Adha.

Arandarenko also lists the working methods of local specialists. In particular, they had such a meteorological theory. If the end of Saur (April) and the beginning of Jauza (May) are cloudy, then the next winter will be cold and snowy, and if the first days of May are rainy, the month of Katoz (November) is expected to be rainy. If it is the other way around, i.e., the beginning of May is clear and warm, then it rains in October. This data is also studied through the winds. In other words, if garmsel (hot wind) is observed until May 25, October is expected to be very cold. If the Harmsel winds continue until October, a snowy and cold winter is expected [10]. It appears that the local people have been able to combat natural disasters by knowing the weather forecast months in advance. In other words, they started taking action from the beginning of the year and prepared according to the expected weather so that their farming or livestock would not be damaged by natural disasters.

Later, the colonial administration began to build its own meteorological stations in Central Asia and thus monitored the weather in the region. The colonial administration built a number of meteorological stations to study weather data in Central Asia. In 1873, observation stations of this type were operating in the cities of Tashkent, Kazalinsk, Shymkent, Khojand, Ora-tepa, Samarkand, Kattakorgan and Karakol[11]. These weather stations monitored temperature, atmospheric pressure, humidity, observed rainfall and snowfall, wind speed, cloudiness, and magnetic storms.

In 1884, the Academy of Sciences of the Russian Empire approved the establishment of "Rain gauge observation" stations under the General Physical Observatory. In particular, in 1884, 400 thunder gauge stations and 100 rain gauge stations were built in different regions of the Russian Empire. However, the colonial government did not allocate sufficient funds

to carry out their activities. Therefore, the General Physical Observatory is looking for those willing to work as observers at these stations in various regions of the Empire. Therefore, this organization addresses the editors of the newspaper "Turkistanskije vedomosti" and asks for help in finding applicants in this process. In addition, through this, the organization planned to cooperate with various agencies. This newspaper published their appeal [12].

In the late 19th and early 20th centuries, the periodical press was considered the most convenient tool for spreading information or announcements among the population in Central Asia. The colonial administration used to provide weather information from meteorological stations through newspapers. In particular, in the 1870s, it became customary to give weather information on the pages of periodicals. Newspapers were given this information by various meteorological stations in the region. In particular, the newspaper "Turkistanskije vedomosti" published daily weather information under the title "Metereological observations" on its pages. It presents 30 days of weather data [13]. This information is presented in a table. It shows the date of each day, the temperature for that day, the wind speed, and the highest and lowest temperature for that day. Three time intervals were selected in the measurement of weather data. That is, these data were collected at 7 in the morning, 1 in the afternoon, and 9 in the evening, and their average number was determined and reported to the population.

On the other hand, the above weather information is given for the whole of Turkestan, and in practice, weather different from this information was observed in some places. Because the above information is the average weather data for the whole country, it is natural that they differ from each other in places. Therefore, in some cases, meteorological stations in regions and uyezds sent the information they received in the form of a letter to newspaper editors. Such messages were sent by the Tashkent observatory. Their information is also presented in the form above and provided one month's weather data on the scale of Tashkent city.

In some cases, people interested in meteorology themselves informed newspapers about weather data. However, they only compared the weather data of the previous days. They sent this information in the form of a letter to the newspaper editors. In these letters, weather data for a month for a certain region or uezd is usually presented in written form. But they did not last. For example, on February 28, 1878, P. Grigorev wrote a letter to the newspaper Turkistanskije vedomosti, informing that he had been collecting weather data since November 1877 [14]. He emphasizes that he is calculating these data between morning and evening. Also, P. Grigorev said that he draws his conclusions through the temperature in the shade. He informs that he is conducting his meteorological observations with the "Reomera" thermometer and that he would like to do this work with more perfect instruments. He reports that he observed the weather in December 1877 and January 1878. He says that winter was relatively rainy and cold. As a result, several houses and walls collapsed in the old part of Namangan. He presented his observations in tabular form to the newspaper. It appears that this person collected weather data for past days and not for future days and wanted to share them with readers.

During the colonial period, some meteorological stations operated for a short time. One of them is Chimiyon meteorological station. This station began its operation in the second half of June 1894 and ended on August 27. The sources do not provide information about why the Chimyon meteorological station was short-lived. This station was located on Chimyon mountain. This weather observation center will be restored for two weeks. The most difficult task in this process was to bring the shelves up. Because the station was located 14-15 versts above the village of Bruch-Mulla, which was the nearest village where transport could run. A chropometer is installed at this station to monitor the weather. Also, a sundial has been installed in order to know the exact time of the day and to facilitate the

analysis of daily weather data based on this. Chimyan meteorological station monitored weather, air pressure and cloud movement [15].

In the late 19th and early 20th centuries, Central Asia experienced unseasonal weather. This unfavorable weather affected the population for several reasons. For example, one of them is excessive heat in winter and the awakening of nature as a result caused farmers to worry. One such phenomenon was observed in 1867 in Tashkent. Residents were even wearing summer clothes due to the heat of the day. In 1892, this situation was observed again in Tashkent. In particular, the night from January 8 to January 9 was hot and dry. Even on January 7, the flowers have already opened and bloomed. In this case, meteorologists shared information about what the next seasons would be like and how people should organize their farming activities. However, each meteorologist came up with different ideas. For example, the first expert stated that warm and rainless winter means cold and rainy spring, while the second one said the opposite. The third predicted that as a result of this weather in winter, the fruits will not be good in spring and summer, while the fourth noted that such unfavorable weather will have a negative effect only on rainfed agriculture, and irrigated agriculture and horticulture will not suffer [16]. Interestingly, these opinions were expressed by meteorologists working under the colonial administration, but they expressed these scientific opinions based on the knowledge and experience of local experts. In particular, these European specialists often referred to the knowledge of local meteorologists in these years.

Harmful winds blow in the summer season in most of the Central Asian region. The Harmful wind not only brought hot air flow, but also influenced people's psyche in the late 19th and early 20th centuries by observing unusual natural phenomena. For example, a member of the Danish Geographical Society, who visited this region in 1896-1899, noted that the sky suddenly turns black during the summer when harmful winds blow. In addition, he mentioned that strong winds blow in the desert and mountainous regions at the beginning of the spring months [17].

In Eastern Turkestan, the wind blew mainly from west to east. In the autumn and spring seasons, the wind speed increased and damaged the properties of the residents. In addition, these strong winds caused landslides in East Turkestan. This caused the population's farmlands and health to be covered with these sand particles during windy times. In summer, these winds created dust fog in the region. As a result, residents had difficulty breathing in the street. Also, during the dust storm, the houses of the residents were filled with dust and the tops of trees and crops were covered with dust [18].

During this period, there were also dusts and they caused some difficulties to the population. In particular, people were panicked by this natural disaster on the one hand, and on the other hand, their health was greatly damaged. On October 11, 1870, at 10 to 15 in the morning, a light wind began to blow in Oratepa, and at 11 to 30, darkness covered the sky. The sun was not visible and the air was filled with dusty fog. The witnesses remember that it was not night, but it was dark. They also say that beyond 5 steps is not visible. Experts reported that the air was covered with 3 layers of dust at this time. This situation continued until 2 o'clock in the afternoon. During this time, the air turned dark brown. Residents of some regions of Central Asia called this natural phenomenon "quyn", while residents of other places called it "riot" [19]. The Academy of Sciences of the Russian Empire is interested in this case. Because in their opinion, this phenomenon was observed more in Central Asia. Therefore, they tried to study this natural phenomenon scientifically. In particular, the Imperial Geographical Society was heavily involved in this.

At the end of the 19th century - the beginning of the 20th century, the northern rain was observed in Central Asia. For example, on January 24, 1872, at 10-11 o'clock at night, a northerly rain was observed in the region. In the sources, information is given about the beautiful color of this oil and its approximate location [20]. Other sources note that a day

before, i.e. on the night of January 23 to January 24, northern rain was observed in the city of Tashkent. According to these data, the northern rain started at 10 o'clock at night and continued until 11 o'clock. At night, the clouds in the sky turned blue [21].

Lack of rain has had a negative impact not only on agriculture, but also on cattle breeding and caused losses. Because the availability of fodder for cattle depended on rainwater, this was considered especially relevant in Turkestan at the end of the 19th and the beginning of the 20th centuries. In particular, in 1880, in the Kazalinsk district of the Syrdarya region, it did not rain enough, and as a result, the grasses in the pastures did not sprout enough. As a result, livestock owners faced problems in providing fodder for their livestock. As a result, the number of camels in the uezd decreased by 50,000 (54%), the number of horses by 44,000 (73%), the number of cattle by 7,257 (43%), and the number of sheep by 482,000 (80%) [22].

In the winter of 1892, unfavorable weather was observed in Central Asia. Gardeners were especially affected by such weather. In particular, the weather was hotter than usual during the day and cold at night, with the temperature dropping to minus 2 degrees. There were cases of water freezing at night. This weather was very different from 1890 and 1891. The hot and cold weather observed during the day and night had a negative effect on the growth of trees. For example, in winter, due to the heat during the day, the trees started sprouting, and due to the frost observed at night, these trees were hit by frost. As a result, the trees and their fruits died [23].

The winter of 1899 was quite cold on the shores of the Caspian Sea. The animals caught cold and many of them died. In the spring, the weather warmed up and there were conditions for irrigated farming. However, as a result of the cold winter, livestock used in agriculture died or became unusable. As a result, farmers could not grow agricultural products. This, in turn, led to food shortages in the Kaspiyorti region. As a result, food prices have increased in this region. For example, the price of a pound of wheat in Ashgabat was 1 ruble and 50 kopecks [24].

The winter cold of 1899 continued in 1900 in Kaspiyorti region. The winter cold of 1900 caused a number of casualties to the population. In particular, 50% of sheep and goats and 20% of large horned cattle were left without food in all uyezds of the region. This situation was also observed in the Russian-speaking resettled population of Ashgabat, Tejen and Krestov districts. That is, they also lost some of their livestock due to the cold in winter. The reduction of livestock in turn affected the population's food, as the population obtained milk and milk products from livestock. In the winter of 1900, the population experienced a shortage of dairy products along with bread products. By February 1900, 62,000 rubles allocated as material aid and loans for the local population of Kaspiyorti region and 12,000 rubles allocated for the Russian-speaking population had already been spent. Therefore, the Governor-General of Turkestan decides to allocate an additional 50,000 rubles of material support for the Kaspiyorti region from other financial sources[25].

In 1907, unfavorable weather was observed in Samarkand region. This year, such a situation had a negative impact on agriculture. In particular, farmers engaged in planting and growing cotton suffered a lot as a result of such weather. This is especially noticeable among farmers who planted cotton on less land. Because their financial situation is limited, they usually have money after the harvest and use this money to plant cotton in the following years. But in 1907 there was a failure of cotton. Therefore, in 1908, cotton farmers did not have economic conditions to sow seeds. In addition, they could not make land taxes and other mandatory payments. As a result, they are forced to ask for a loan from the colonial administration. The heads of the uezd will inform the military governor of Samarkand region about this. For example, on June 6, 1907, the head of Jizzakh uezd reported that the farmers of Zomin, Yom, and Rabat volastas suffered losses due to bad

weather. In his report, he notes that the farmers of this volost experienced floods due to heavy rains and this situation caused damage to the farmers. This type of information was also sent by the head of Kattakurgon uezd on May 9, 1907. He said that on May 3, there was a heavy rain in Chimboy region, which caused damage to agricultural lands. As a result of this rain, 100 tons of cotton and 50 tons of sorghum in Saray village, 20 tons of cotton and 20 tons of sorghum in Bobonazar village, 10 tons of cotton and 8 tons of sorghum in Shodmon village, 9 tons of cotton and 10 tons of sorghum in Rajab village became unusable. The military governor of Samarkand region asks the governor-general of Turkestan to give a loan for the farmers who have suffered losses[26]. Turkestan General-Governor's Office decides to allocate a total of 28,700 rubles of loans for the farmers of Samarkand [27].

The administration of the Russian Empire used different ways to find funds for natural disasters. In particular, this process was carried out at the expense of the population in some cases. He tried different methods to collect money from the population for natural disasters. One of them was "charity lottery". In particular, in 1891, there was a lack of harvest. On November 18, 1891, the Ministry of Internal Affairs and the Ministry of Finance of the Russian Empire jointly developed the charter of the "charity lottery" intended to provide assistance to those affected by the lack of harvest. The amount of these lottery tickets was 1,200,000, and it is planned to collect 6,000,000 of them. One ticket consists of 5 coupons. That is, 5 people can buy one ticket. If there is a win in this case, it is divided among five people. The price of each ticket is 5 rubles and the value of each coupon is 1 ruble. Of these 1,200,000 tickets sold, 2,928 won. The biggest win was 100,000 rubles, and the number of winners was one person. The minimum amount of winnings was 250 rubles, and the number of winners was 2,600[28].

On the other hand, these "charity lotteries" were forcibly sold to the population itself. For example, in Syrdarya, Samarkand and Fergana regions, a certain amount of tickets were distributed for the sale of these "charity lotteries". The governor-general of Turkestan gave an order to the heads of regions that the deadline for the sale of "charity lotteries" was July 31, 1892, and that the money and reports on the tickets sold on August 1 should be sent to St. Petersburg[30]. The head of the Syrdarya region noted that 2,000 lottery tickets were sent to this region for sale, 1,708 of them were sold by February 17, and the total price of the sold tickets was 8,540 rubles. He continued his opinion and noted that the remaining 292 tickets were sold to the public by July 30 and that the proceeds from the "charity lottery" amounted to 1,460 rubles[30].

3 Conclusion

In conclusion, in the late 19th and early 20th centuries, farmers and herdsmen in Central Asia monitored weather data. They had their own knowledge and skills in this field. In addition, sometimes residents turned to specialists with deep knowledge in the field of meteorology. These specialists served in this field, relying on the books of scholars who appeared in the region. By the period under study, the Russian Empire had built meteorological stations in many places in the region. Daily weather temperature and climate change were observed at these stations. During this period, the observation of unusual natural phenomena that are not characteristic of the season had a great negative impact on agricultural crops and horticulture. As a result, these environmental disasters harmed the population and their health.

References

- I.N. Iz Namangana. // Turkestanskije vedomosti. - 1885. - No. 31.
- National Archive of Uzbekistan, Fund I-81, List 1, Collection 24, Sheet 98.
- National Archive of Uzbekistan, fund I-717, list 1, collection 6, page 339.
- National Archive of Uzbekistan, Fund I-81, List 1, Volume 24, Sheet 97.
- National Archive of Uzbekistan, fund I-717, list 1, collection 6, page 339.
- National Archive of Uzbekistan, fund I-717, list 1, collection 6, page 340.
- Bojinskaya L., Boroshko S. Major General Georgy Arandarenko is the chief investigator of the Bukhara Khanate and Afghan Turkestan. // Vostochnyy arxiv . No. 1 (45) . 2022 . - p. 17-27.
- Arendarenko G. O meteorologicheskix poznaniyax tuzemtsev Zeravshanskogo okruga. // Turkistan newspaper. - 1877 . - No. 22 .
- Pickett. J. Polymaths of Islam: Power and networks of knowledge in Central Asia. – New York : Cornell University Press, 2020 . - 320 p.
- Arendarenko G. O meteorologicheskix poznaniyax tuzemtsev Zeravshanskogo okruga. // Turkistan newspaper. - 1877 . - No. 22 .
- Sweden o climate Turkestanskogo kraya. // Turkistan newspaper. - 1873 . - No. 12 .
- Question about Turkestan meteorology. // Turkistan newspaper. - 1887 . - #34.
- Teixha N. Meteorologicheskie nablyudeniya. // Turkistan newspaper. - 1875 . - #5, 7, 9, 12, 15-20, 22, 28-30, 37, 39, 43, 44, 49.
- Grigorbeva P. [Meteorologicheskie nablyudeniya v Namangane v XI i XP. 77 i 1.78]. // Turkestanskije vedomosti. - 1878 . - No. 9 .
- Sbornik materialov dlya statistiki Sog'darinskoy oblasti. - Tom IV . Tashkent . 1895. - p. 84-85.
- [Isklyuchitelnaya pogoda v Tashkente]. // Turkestan newspaper. - 1892. - #3.
- Olufsen O. The Bukhara emir of Bokhara and his country: Journeys and studies in Bokhara. - Copenhagen, 1911. - p. 251-252, 255.
- Kornilov Kashgaria, Eastern Turkestan: Opyt voenno-statisticheskogo opisaniya. - Tashkent: Tipografiya Shtaba Turkestanskago v oennago okruga, 1903. - p. 215-217.
- Krasnyy tuman v Ura-Tube. // Turkestanskije vedomosti. - 1871. - #16 .
- Severnoe stanie. // Turkestanskije vedomosti. - 1872. - #5.
- Severnoe stanie. // Turkestanskije vedomosti. - 1872. - #6.
- National Archive of Uzbekistan, fund I-717, list 1, collection 6, page 341.
- Turkestanskije vedomosti. - 1892. - No. 28.
- National Archive of Uzbekistan, Fund I-1, List 17, Volume 89, Sheet 49.
- National Archive of Uzbekistan, Fund I-1, List 17, Volume 89, Sheet 64.
- National Archive of Uzbekistan, fund I-18, list 1, collection 6650, sheets 6-7.
- National Archive of Uzbekistan, fund I-18, list 1, collection 6650, page 7.
- National Archive of Uzbekistan, fund I-17, list 1, collection 14855, sheets 1-1.
- National Archive of Uzbekistan, fund I-17, list 1, collection 14855, sheet 134.
- National Archive of Uzbekistan, fund I-17, list 1, collection 14855, sheet 148.