



ECONOMIC ANALYSIS OF POLLUTION OF THE NORTHERN DISTRICTS OF SURKHANDARYA REGION BY TADJIKISTAN'S ALUMINUM FACTORY

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Received: 2 nd April 2021 Accepted: 20 th April 2021 Published: 10 th May 2021	This article analyzes the pollution of the northern districts of Surkhandarya region with waste from the Tajik aluminum plant and its economic damage.
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INTRODUCTION

The increase of the world's population by 5.5-6.0 times a century, the rapid development of science and technology, environmental and economic problems due to the growing tension between nature and society and their negative consequences lead to the derailment of ecological balances between nature and society.

According to the research conducted by A.Kakharov, Sh.Karimov (2016) in Sariosiya, Uzun, Denov districts of Surkhandarya region, located near "TALCO DUK", it has been observed by the scientists that 8.5% of total cattle, 7.7% of sheep and goats, 8% of poultry, 13,7% of equine has more than 20 different diseases in these livestock and poultry species due to endogenous, exogenous and endoexogenic factors. Especially if genetic diseases are not prevented, the economic indicator of the industry will be in crisis.

In the atmosphere of Sariosiya and Denau districts PNZN^o1 Sufiyon Sariosiya; PNZN^o2 Dashnobod Sariosiyo; According to the results of observations at PNZ Uzbekistan Denau observation points, in July 2020 in each of PNZN^o2 and PNZN^o3 points for 3 days, in August - 15, 14, 16, in September - 11,5,2, in October - 10,3,2, 6,3,4 days in November, dust levels were higher than the allowable norm (REM). This is evidences by the fact that in recent years, as a result of negotiations between the leaders of the two countries of Uzbekistan, a number of equipment and technologies have been updated at TALCO DUK.

In recent years, the print media of Uzbekistan as well as media of foreign countries, a number of Internet sites have been broadly discussing the trans-boundary damage caused by large industrial enterprises in the region. In this regard, special attention is paid to the issue of transboundary pollution of the northern regions of Surkhandarya region by emissions from the State Unitary Enterprise "Tajik Aluminum Company" (SUE "Talko"). Built in 1975 on the basis of technologies that do not meet modern requirements, without complying with environmental standards, the plant has become a source of toxic compounds in the environment. The Tajik Aluminum Plant is located sixty kilometers west of Dushanbe, near the town of Tursunzoda.

According to available data, it has a production capacity of 350-400 thousand tons of aluminum per year. Due to the fact that the enterprise is located only 10 kilometers from the border of the Republic of Uzbekistan, more than 1.1 million people in Sariosiya, Uzun, Denau, Altynsay and Jarkurgan districts of Surkhandarya region are under its harmful influence. Talco's industrial waste has a negative impact on the environment and agriculture in Surkhandarya region, and the district's the economy is greatly suffering. First of all, the atmosphere, air is polluted. State Unitary Enterprise "Talko" annually emits 22-23 thousand tons of toxic substances into the atmosphere. Their main components are sulfur dioxide, nitrogen oxides, hydrogen fluoride and other toxic substances. Among them, hydrogen fluoride is the most dangerous, with emissions of about 122 tons per year.

Analysis of wind directions shows that it blows mainly to the northern and northeastern directions, as a result of which the main amount of toxic substances emitted by the plant is scattered within 18-19 hours by air, flows to Sariosiya, Uzun, Denau, Jarkurgan and other districts of Surkhandarya region and poisoning the areas here. For example, in 2006-2011, the content of hydrogen fluoride in the atmosphere of the territory of Sariosiya district exceeded than the average annual allowable concentration level by 1.8-2 times. Especially in summer, a highly condensation of hydrogen fluoride is observed, which is 3. 4 times more than the allowable concentration. Due to the increase in the amount of hydrogen fluoride in the atmosphere, soil and water resources are being damaged, crop yields and livestock productivity are declining, as well as it is affecting the health of the population and their genetics. Especially the soil is damaged a lot. Studies conducted in the areas affected by TALCO's shows that large amounts of

mobile toxic fluoride waste have been collected in the soil. Currently, areas within a 150-kilometer radius of the source of contamination are intoxicated with water-soluble fluoride. Due to the collection of fluoride in the mentioned areas for many years and its strong impact, the soil composition has completely changed, which leads to a violation of its chemical-biological function and the deterioration of the ecological situation. It is also worrying that the toxic substances emitted by TALCO have a negative impact on crops and livestock. The collection of highly concentrated of water-soluble fluoride in the soil for many years also giving a negative impact on plant development, resulting in a decline in the yield and quality of vegetable crops. For example, in Sariosiya, Uzun and Denau districts, which are heavily contaminated with hydrogen fluoride, the yield of vegetable crops has decreased by 46 percent. In addition, the toxins emitted by SUE "Talko" have a negative impact on seed germination, fruit set of trees, plant growth. For example, the yield of melon crops by 24.4%, vegetables by 34% and grapes by 37.8% decreased. The concentration of fluorides in fruits and vegetables is more by 11-19 percent of the permissible concentration, and in wheat - 5-6.5 percent has been determined and it is very worrying situation. In addition, the consumption of plants with high levels of fluoride in livestock leads to serious physiological changes in their body, such as calcium and iodine imbalance, teeth moving and falling out, curvature of the tubular bones, joint injuries, occurring fluorosis, osteodystrophy, osteoporosis, osteomalacia, rickets and other diseases. For example, clinical studies have shown that in Sariosiya district, 80-90 percent of animals aged 3-5 years have black spots on their teeth, their eruption, pierce, and eventually fall out. High levels of fluoride in the composition of food and biomaterials lead to serious changes in the body of animals, which leads to half-breeding, reduced resistance to the environment, invalidity and the birth of dead offspring. The average specific weight of cattle in these districts is 15-20 kg less than in other districts of the region. In addition, during the study, the concentration of fluoride in milk exceeded than the allowable concentration by 9-13 percent, and in meat by 10.9 percent.

The most dangerous aspect is that the substances emitted into the atmosphere by TALCO have a negative impact on the health of the population and the genetic. In addition to hydrogen fluoride, large amounts of toxic gases of carbon and sulfur oxides are released during aluminum production. They cause purulent bronchitis, chronic inflammation of the lungs, dizziness, migraines and increased blood pressure in humans. Toxic waste in particular has a dangerous impact on women's reproductive health. In these districts of Surkhandarya region, the sickness due to pathological changes in children and adults is 3 times higher than the regional average. At the same time, in 2011 the total morbidity of the population in Uzun district increased by 24.2% compared to 2006, in Sariosiya district by 12.7%, the number of respiratory diseases by 3.4 times, diseases of the endocrine system by 2.8 times, digestive diseases by 27.7 times. diseases of the blood and blood-forming organs increased by 29.4%. The results of health examinations of the population of Sariosiya district, living in the zone of influence of SUE "Talko" showed that the following diseases are more common in the structure of general diseases: - Respiratory system (27.8% in 2011 instead of 24% in 2006); - digestive organs (14.7% instead of 12.6%); - endocrine system (14.1% instead of 11.2%); - blood and blood-forming organs (15.3% instead of 12.6%). As a result of the negative impact of the environment on the health of the population, the average life expectancy in the above-mentioned districts is 68 years for women and 65 years for men. However, in the country this figure is 75 years for women and 72 years for men. In areas most affected by TALCO waste, comparison to Shurchi district of Surkhandarya region, miscarriages (2-2.5 times more), abortions due to abnormal fetal development (9 out of 16 women per thousand live births), premature childbirth (13 out of 34 women per 1,000 live births), underweight and low birth weight (less than 2,500 grams) (26 out of 35-45 children per 1,000 live births) are observed. In these districts, 95% of pregnancies are associated with high levels of thyroid gland, diseases of the genital system diseases.

In addition, as a result of fluorine-containing wastes from the Talco State Unitary Enterprise, during ultrasound examination of pregnant women, congenital malformations in the development of fetuses increased from 0.6% in 2006 to 2.8% (4.6 times) in 2011. Biochemical tests of the blood show that this figure increased from 8.2% to 14.8%, or 1.8 times, respectively. From 2006 to 2011, screening of pregnant women revealed congenital defects in fetal development in 687 cases, and biochemical examination of their blood revealed pathological changes in 979 cases. At the same time, according to the monitoring, the number of stillbirths in Sariosiya district has increased 7.7 times in the last five years. In 2011, the number of stillbirths in Denau, Sariosiya and Uzun districts was 27.3% higher than the regional average. In addition, in 2011 in these districts: - 3106 children with disabilities under 16 were registered, which is more by 9.5% and in Sariosiya district more by - 17.1% compared to 2006; - 12,655 people over the age of 16 are registered with disabilities, which is 1.5 times more than in 2006 and 1.6 times more in Sariosiya district. The economic damage caused by TALCO SUE to the health of the population and the environment of Surkhandarya region of the Republic of Uzbekistan has been analyzed. According to estimates, the ecological and economic damage caused to the environment in four districts of the region (Sariosiya, Uzun, Denau, Jarkurgan) in 2006-2011 is estimated at \$ 100.8 million (environmental and economic damage was calculated using Engel's indicators). The economic damage to agriculture in Denau, Jarkurgan, Sariosiya and Uzun districts of Surkhandarya region over the past five years is estimated \$ 174.97 million, including: - due to declining crop yields - \$ 8.08 million; - due to the reduction in the amount of milk produced - \$ 33.2 million; - due to reduction of the weight of livestock - 133.7 million dollars.

According to estimates, the annual economic damage to public health and genetics exceeds \$ 31.2 million. In particular, \$ 20.8 million is spent from the state budget and \$ 10.4 million by the population to restore the health of the population and preserve its genetics. Among them, for the of treatment of fluorosis is 16.07, for improving the health of women and children - 0.75, for the treatment of diseases of the blood and blood-forming organs - 4.8, for the treatment of endocrinological and digestive diseases - 3.3, respiratory \$ 3.9 million is being allocated for the treatment of diseases of the organs. It should be noted that the economic damage in 2007-2011 alone exceeded \$ 156 million. Between 2007 and 2011, \$ 28 million was spent from the state budget for the needs of children with disabilities under the age of 16, as well as people with disabilities over the age of 16. Thus, the total economic damage caused to Uzbekistan by TALCO over the past five years amounted to \$ 447.3 million. A year ago, residents of Surkhandarya region, concerned about the dangerous consequences of the activities of SUE "TALCO", held a series of protests to draw the attention of the management of the company and international organizations. They called on the UN General Assembly, UNEP and the World Health Organization to immediately stop the harmful production of the state unitary enterprise "Tajik Aluminum Company" and to conduct environmental expertise to be involved leading international independent experts to determine the damage caused to the population, flora and fauna of the region, fully modernize the plant and equip it with modern cleaning and treatment facilities, and fully compensate for the damage caused to the health of the region's population and the environment over several decades of operation. The petition, signed by more than 757,000 people of Surkhandarya region, states: "We believe that the fate of people who shed their umbilical cord blood in this land and deprivation of our right to have a healthy environment without hazardous industrial waste in our motherland will not leave the international community indifferent."

The Ecological Movement of Uzbekistan sent the appeal to UN Secretary-General Pan Gi Mun, Executive Director of the United Nations Environment Program Achim Steiner and Director-General of the World Health Organization, Dr. Margaret Chen, and called for the protection of the environment and population of the region affected by industrial waste produced by Tajikistan Aluminum Factory SUE. These issues were discussed at the International Conference "Cross-Border Environmental Problems of Central Asia: Application of International Law Mechanisms in Solving Them" on November 16-17, 2010 in Tashkent, as well as on December 9, 2011 at the conference "Environmental security, actual problems in health security: The role of public institutions in solving them" was discussed comprehensively at the international roundtable. These issues which concerned by the public have been repeatedly delivered to the management of TALCO. For example, in September and October 2011, the Ecological Movement of Uzbekistan sent a letter to the company's management to discuss the transboundary impact of the enterprise on the environment and public health, sources of pollution, as well as offered to conduct joint measurements in the affected areas and to hold a meeting at the plant.

As a result of the analysis of the consequences of cross-border damage caused by the Tajik aluminum plant in the regions of Uzbekistan, the following conclusions can be drawn: 1. The ecological situation in Sariosiya, Uzun, Denov and Jarkurgan districts of Surkhandarya region of Uzbekistan, that located in the zone of exposure to harmful substances released to the atmosphere by TALCO, ecological situation is deteriorating year by year, which negatively affects the health and gene pool, agriculture and livestock of these districts, causing great ecological and economic damage to the Republic of Uzbekistan. 2. TALCO must compensate the damage caused to the Republic of Uzbekistan in the amount of \$ 447.3 million. At the same time, in order to reduce the negative impact of harmful substances emitted by SUE "Talko": 1) to stop the activities of the factory that endanger human life and harm the environment; 2) assessment of the impact of TALCO on the environment; 3) Complete modernization of technological processes and gas treatment equipment at SUE "Talko", consistent implementation of technical work program activities for the gradual reduction of harmful substances emitted by SUE "Talko"; 4) Equipment should be procured to create an automated system that monitors the presence of hydrogen fluoride, heavy metals, including resin compounds, benzopyrene and other pollutants to the environment.

From the above, it can be concluded that the problem of TALCO SUE is a matter of great concern for the environment and health of the population of the northern districts of Surkhandarya region of Uzbekistan, which, if not prevented, will negatively affect the gene pool of the population and lead to economic crisis

REFERENCES:

1. Mirziyoev Sh.M .. "Strategy of actions of the President of the Republic of Uzbekistan on five priority directions of further development of the Republic of Uzbekistan" for 2017-2021 [http:// Strategy. Regulation. Gov.Uz Uz / Document / 2](http://Strategy.Regulation.Gov.Uz/Uz/Document/2)
2. Mirziyoev Sh.M. Speech of the President of the Republic of Uzbekistan Shavkat Mirziyoev at the first summit of the Organization of Islamic Cooperation on science and technology. // Xalq so'zi, September 11, 2017
3. Law of the Republic of Uzbekistan "On protection and use of wildlife" .// Xalq so'zi, September 20, 2016
4. Law of the Republic of Uzbekistan "On protection and use of flora" .// Xalq so'zi, September 22, 2016
5. Law of the Republic of Uzbekistan "On Waste" // News of the Oliy Majlis of the Republic of Uzbekistan. -2002. -№ 4-5.-72- Article.
6. Law of the Republic of Uzbekistan "On Environmental Control" // Collection of Legislation of the Republic of Uzbekistan.-2013.-№ 52.- Article 688.
7. Resolution of the President of the Republic of Uzbekistan "On improving the system of public administration in the field of ecology and environmental protection" dated April 21, 2017 No pp-5024.

8. Resolution of the President of the Republic of Uzbekistan dated April 21, 2017 No pp-2916 "On measures to radically improve and develop the system of implementation of works related to household waste in 2017-2021."
9. Karimov I. A, "Uzbekistan on the threshold of the XXI century: threats to security, conditions of stability and guarantees of development. - t .: Uzbekistan, 1997.
10. Zokirov Kh. Kh., Kuldosheva Sh.A. General issues of ecology and nature protection. - Karshi: Nasaf, 2010.
11. Zokirov Kh. Kh., Kuldosheva Sh. A. Atmospheric air protection: Teaching manual. - Karshi: Nasaf, 2010.
12. Zokirov Kh. Kh., Kuldosheva Sh. A. Problems of protection and rational use of water resources: Teaching manual. - Karshi: Nasaf, 2010.
13. Zokirov Kh. Kh., Kuldosheva Sh. A. Use and protection of land resources. - Karshi, Nasaf, 2010.
14. Zokirov Kh. Kh., Kuldosheva Sh. A. Nature conservation and international cooperation. - Karshi: Nasaf, 2010.
15. Zokirov Kh. Kh., Zokirova Yu. Kh., Chorlieva Sh.Q. "Environmental Factors Causing the Economic Crisis." "Surkhan-Nashr". Termez-2018.
16. Zokirov Kh. Kh., Normurtov O.U., et al. Soil-climatic conditions of Surkhandarya. Scientific journal UNIVERSUM: chemistry and biology Moscow 2018.
17. Zokirov Kh. Kh., Zokirova Yu. Kh., Chorlieva Sh.Q. "Environmental Factors Causing the Economic Crisis." "Surkhan-Nashr". Termez-2018.
18. Zokirov Kh. Kh. Rational use of natural resources. Textbook. Surxon Nashr-2020.
19. Statistics of the Committee for Nature Protection of Surkhandarya region for 2010-2017.
20. Urinov B.I. Edited by "Activities in the field of environmental protection and rational use of natural resources" - CHINOR ENK 2010 .
21. "The role of chemistry in the economic development of Uzbekistan" - Republican scientific-practical conference, Samarkand-2018.
22. monitorin.meteo.uz