



Teaching of the Ecology of Aral-Syrdarya Basin in the Higher Educational Institution

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Mini Review

Volume 3 Issue 4

Received Date: September 28, 2020

Published Date: November 02, 2020

DOI: [10.23880/oajwx-16000147](https://doi.org/10.23880/oajwx-16000147)

Annotation

It is not simple to form ecological literacy; it requires the development of student's elements of systemic thinking, which is achieved already in a mature state of the individual. In light of this, the importance of teaching ecology at the university has greatly increased and here we are faced with a number of problems. The article considered the ecological problem of Aral-Syrdarya basin and actions to improve the state of the ecology of the Aral region.

Keywords: Ecology; Aral Sea; Aral-Syrdarya Basin; Research; Future Specialist; Analysis

Introduction

In the teaching of environmental problems, the reasons for its occurrence, based on concrete scientific and practical information, contributes to the training of future conscious and qualitative specialists. Today's current textbooks contribute to the development of future specialists, but while teaching any environmental problems, it is important for the trained, competent, qualified specialists to develop their vision of the use of the student's self-study. Therefore the purpose of this work is to study and analyze a specific environmental problem from a scientific research point of view; it is possible to train competent specialists and access to improve its competence. Guided by these principles, we believe that the formation of the educational process will be able to solve many issues.

Based on this we can say that the policy of the problem of Aral-Syrdaryabasin, the emergence of the "Aral tragedy" appeared in the goal of becoming the independent state of the cotton, and if we examine basis, causes and consequences of the Syrdarya and Amudarya rivers before 1991, and subsequently in Central Asia, after the independence of Kazakhstan, we can see that the causes are made by human.

Currently, 51 reservoirs and gas-power stations are built up to the Aral Sea, with 13 of them being along the Syrdarya River, and 38 of them are built along the Amudarya River. And nowadays, the condition of the Aral Sea can be conditionally divided into three stages.

The first phase of today is from 1920 to 1965, the second stage is from 1966 to 1991, and the third stage is from 1992 to 2017, should be considered up to these days. Since the middle of the nineteenth century, for the development of the national economy, ponds and dams of the Syr Darya and Amudarya have been divided into two reservoirs, such as the main arterial artery of the Aral Sea, without taking into account the possibility of nature. In the first stage (1920-1965), eight reservoirs were constructed in the Syr Darya River: two of them are located in Tajikistan (Kairankum, Kattasai), Kyrgyzstan (Ushkorgan), Uzbekistan (Toyabugas, Farhad, Karkidon, Kassansay), and in Kazakstan - Bogen Reservoir and in the river basin The Amudarya has a total of 15 large reservoirs, which are twice as large as the reservoir.

The second phase (1966-1991) included 11 eleven reservoirs along the Syrdarya river basin, five in Kyrgyzstan, the other five in Uzbekistan, and one in Kazakhstan-Shardara

reservoir, and nine large reservoirs along the Amudarya River. Analyzing this we see that 23 reservoirs were built at the first stage and at the second stage there was built another 20 reservoirs with a capacity of not less than 23 reservoirs. Comparing these two stages-with each other the Aral Sea water decreased 2.5 times. In fact, the Amu Darya river flow in the Aral Sea from 1920 to 1960 was about 4 times smaller than in 1990, and today the Amu Darya River does not pour into the Aral Sea.

The reservoirs and dams built on the Amudarya and Syrdarya rivers, the ponds, were three times as big as the river Amudarya compared to the Syr Darya River, and the river was blocked. Today, the well-known small Aral Sea is being restored. By the efforts of the Republic of Kazakhstan in 1999 the current Kokaraldam was built and it is known that it was washed away with water. In 2005, with the support of the World Bank along the Aklakhydrosystem with a length of 13 km, the North Aral hydroelectric power station was built along the Kokaral River, so the Little Aral Sea appeared, this complex was launched in 2005 in August 7, at 20.47, the water began to fill, and in 2006 on February 2, the water level reached a 39-meter unit in six months, but it had to be filled within 36 months.

So, we can say that a new life has begun for people of the local villages of northern Aral. The reason for this is that water has come to the suburbs. Thanks to the Kokaral dam, more than 20-30 lakes and ponds have appeared. Fish production was re-launched and fish farms emerged. Foreign partners are contributing to the development of fishery, especially in Denmark. "Aklak" hydroelectric power station is installed in the mouth of Syrdarya river water into the small Aral Sea, in this hydroelectric power station there is a special canal that runs from the river to the sea.

And there is no canal in the 13km watercourse a large number of fish in the spring may die by a large amount of water discharged into the Greater Aral. According to the opinion of experts of the "Aklak" hydroelectric power station and the North Aral Sea (SAT) dam, from 12 to 13 bln.m³ water flows from Small Aral to Great Aral every year, this water evaporates without reaching the Great Aral Sea becoming small lakes, and the fish disappears with water, which causes different difficulties. Today, the Greater Aral is divided into eastern and western parts, which means that nowadays no water comes from these parts of Uzbekistan [1].

Let's look at the question of the current state of the Great Aral. The Great Aral Sea is divided into two parts: the West and the East Sea; its water is strongly salted and mineralized from 130 to 350 g/l. Until 2008, there was a channel with a hydraulic link with a depth of 7 meters, i.e., it flows along the eastern sea to the West Sea together with bottom sediments.

Therefore, we need to study the eastern and western parts of the Greater Aral Sea, and consider that it is necessary to supply water to the West via a dedicated channel to the east or to the west.

In general, the results of a study of the radiological state of the Syrdarya-Aral basin that have been conducted since 2008, teaching environmental problems such as the tragedy in the Aral Sea in higher education institutions or conducting research can be trained by competent specialists. Sampling and research are conducted in accordance with the norms of the Republic of Kazakhstan. The results of these studies can be summarized as follows. The water of the investigated basin is shown in the contamination of rivers with radioactive nuclides, especially in settlements near the uranium industry, whereas α -activity is twice as high as the lowest (minimum) by 250 times. (The reason for this is the impact of uranium mining by underground leaching). In 2000 transitions in trans boundary waters of the Republic of Kazakhstan, where α -activity was 2 times higher, and in 2016 river water in Shardara reservoir increased from 2 to 5.45 times, and these radionuclides can accumulate in the Shardara reservoir [2,3].

Anthropogenic polluting radionuclides in the waters of the Syr Darya River in the spring of 2003 increased by 5-6 times in Aman-Koy and Bogen settlements near the Aral Sea, whereas in 2017 α -activity in the Aral Sea increased 8-fold, i.e., the concentration of radionuclide residues in the river water accumulated in the Aral Sea. In general, the discipline "Ecology and sustainable development" is studied; the problem of the Aral Sea is considered as a special chapter and is studied in all higher educational institutions of Kazakhstan.

Scientific research institutes (geography, geology, ecology, etc.) and scientists of universities in natural sciences and mathematics conduct scientific works on the basis of grants from universities, international INTAS and various foundations on arbitrary and initiative topics about the situation in the Aral-Syrdarya basin, for example: every academic year in our university, under our leadership, 1-2 master's and diploma works are defended. The state is mainly focused on scientific topics on the applied and business-market economy. That is why they can not be satisfied with the fact that drinking water has come to the Aral region, and the small Aral Sea is filled with water; international organizations together with the Central Asian countries should develop a plan and work towards development of the Aral Sea, including the Great Aral Sea. The reason is that today's small Aral Sea is only 6-10% of the former Aral Sea [4].

September 9-17, 2017 the teachers of the University of Tsukuba organized a joint expedition of Kazakh and

Japanese scholars where they got acquainted with life, educational institutions and met with the students of the Aral region, they discussed the teaching of the Aral tragedy in secondary school and higher educational institutions, shared opinions and also discussed conducting joint research works. Therefore, it is advisable to hold a round table, make specific decisions, if possible, use space data, unite states and international organizations dealing with this problem and positively resolve this issue, because today the tragedy of the Aral Sea is not only an internal problem of Central Asian countries and Kazakhstan, but also the environmental problem of the whole world, because it attracts the whole world. Currently, more than 60 million people, including Afghanistan, live in this region; about 4 million of them live in the Aral region. This is mainly residents of Karakalpakstan, Khorezm, Uzbekistan, Dashowuz district, Turkmenistan and Kazakhstan, Kazalinsk and Aral regions of Kyzylorda oblast and Aktyubinsk region.

At the same time, the ecology of the Aral Sea region will be improved if the following measures are implemented:

- It is very important that the mouth of the Amudarya River be brought to the Aral Sea, for this it is necessary to open other jobs and provide financial assistance instead of water coming from Tajikistan and Uzbekistan.
- The location of military scientific grounds located on the islands of the 'Vozhrozhdenie', 'Barsakelmes' and 'Lazarev' in 1991-1992, the detection of toxic burials of toxic substances buried in cemeteries with the help of state or international organizations (registers), and it is necessary to control it.
- It is necessary to develop a long-term program "Green Aral", growing on dry, relief lands plants and saxaul plantations, adapted to growth in sandy and desert regions.
- At present, the Big Aral Sea takes 12-13 billion cubic meters of water a year, many of these waters evaporate becoming salty islands, exploring the Great Aral entirely, from the border of Kazakhstan and Uzbekistan, i.e. taking into account the geographic technical structure of the relief, by studying the East Sea of the Great Aral and growing saxaul plantations, then gradually to completely

turn the East Sea to the West Sea, it is necessary to build a second dam and hydraulic system, which is a very complex and expensive project, and this can extend to several kilometers.

- To work with universities and schools located in the local area (for example, in South Kazakhstan and Kyzylorda oblasts), establish partnerships, create joint projects and discuss their results at a special round table, symposium and conference - for environmentally sustainable development it is necessary to jointly conduct environmental research with the younger generation.
- The Aral Sea, which has now been restored from the present Aral Sea, is about 10-15% of the former Aral Sea and the current situation of the Great Aral Sea needs to be published in local, national and international media and scientific mass publications.

Conclusion

In conclusion, higher education institutions teach environmental problems not only through analysis, but also through practical and laboratory researches, and only then qualified specialists are trained.

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