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APPROACHING GLOBAL WATER-ECOLOGICAL CATASTROPHE AND MEASURES OF ITS PROPHYLAXIS

F. V. Shestakov

LLP "OBIS" drinking plant

Keywords: problems of fresh water, water-ecological catastrophe, theory of origins groundwater, condensation water vapor in the atmosphere.

Abstract. Created overview of the largest water and environmental disasters Eurasia designated their causes, which led to shortages a fresh water. Based on overview makes about need search an alternative source or several sources production of fresh drinking water. As such a source ground and verified practice and scientific researches method of using constantly renewed water vapor atmosphere. Which will allow remove tension of water - environmental problems, avoid military conflict on water, decrease risks of terrorism and will solve food and drinking security of mankind.

Introduction. Currently in scientific community more and more often draws attention to alarming situation in the sphere of water and environmental problems, will predict water- environmental collapse, a sharp degradation in the quality of fresh water and a decrease it reserves in natural reservoirs and associated with it growing crisis in the decision food programs many countries [1, 2].

According to the UN, from water shortages suffer 2 billion persons. The scientists - (Medeu A.R., Malkovsky I.M., Toleubaeva L.S.) are concerned that in 2015, constant shortage water will suffer half the world's population, and still after 10 years - already two-thirds of the world's population. The water rapidly becomes one of the most scarce natural resources. The current century safely possible called the "century of water problems" [3]. This concern moves not in a vacuum, but in numerous facts changes of natural and water-ecological situation. Many natural reservoirs and rivers are polluted and poisoned by industrial waste and pesticides, predatory or unwise destruction of huge forests resulted in an increase drought years.

We present just some of the most tragical examples of unreasoned impact on the environment.

Aral Sea catastrophe. In 1848 a shiny naval officer Alexey Butakov was sent to Central Asia for study the characteristics of this natural wonder. He was stunned by the size and grandeur of a huge water area of endless lifeless sands. When Butakov studied along and across and depth of this ancient sea, determine its size, the members of the Imperial Russian Geographical Society were extremely astounded its quantities: for that time Aral Sea was length from the north-east to south-west 428 kilometers, the width reached 284 kilometers and the maximum depth reached 68 meters [4].

In 1908 year L. Berg earnestly refuted existed at that time views on what Aral Sea should gradually to grow shallow under influence "progressive desiccation of deserts." Young scientist has shown that there is an alternation moist and dry periods. For this fundamental work L.Berg immediately was awarded a doctorate of Geography and a gold medal from Imperial Russian Geographical Society, and on the map of Aral Sea appeared Berg's gulf [5].

For the first time begun falling of sea was fixed back in 1981. But nobody then imagined that the first step impending environmental catastrophe. And now on this amazing sea there are only a small lake, called the Small Aral.

By early July 1988 in Berg's strait only stayed narrow channel through which water from north of the Small Aral Sea flows to south into Big, was informed that urgently needs to put a dam in the Berg's strait, otherwise the channel Syrdarya will turn into the Big Aral and the Small Aral has dried completely.

To save the Small Aral Sea government Republic of Kazakhstan covers Berg Strait dam filled up with local materials. In August 1992 the dam had already stood. To the north from it are water Small Northern Aral, to the south from dam - waterless desert Aralkum, the former bottom Great South Aral.

Thus at the Small Aral has also and other problems. According to the newspaper Karavan of 22 March 2013, Aral population face a dilemma: or sea waves will splash near the Aral Sea, or it will become deeper and fishes in the Aral Sea will be more but water will not come to the city.

According to the Head of Laboratory brackish Hydrology Zoological Institute of Russian Academy Sciences, doctor of biological sciences N. Aladin, increase surface of the Small Aral will lead to desalination of this small water area. According to N. Aladin increasing surface of sea will be due to fresh waters Syrdarya and the lake Kambash. The water in the sea will desalinate. This means that fishes will be less, because it accustomed to live in brackish water. To the Aral further developed necessary or to increase even higher Kokaral dam, or build another dam near the village Ushtobe. In the first case the Aral will become deeper, increase the number of fish. In the second - area of sea will increase, and it will return to the Aral.

The Aral Sea region includes Karakalpakstan and Khorezm region of Uzbekistan, Kyzyl-Orda region of Kazakhstan and Tashauz region of Turkmenistan. The total population people living in the region - about 4 million persons. By most measures of living standards and social development, the region takes one of the last places and currently are an environmental disaster zone.

As early as in 1989 kazakh poet Mukhtar Shakhonov in the article "The Aral Sea and our morality" [6] remembering research scientists doctors M.A. Orlova and J.U.Ahanova, professor A.A. Tursunov, noted that "from the bottom dried up the sea in air rises each year before 75 million tons of salty dust and sand. But this is only visible particles, loops which are fixed spacecraft. From marsh surface rises into the atmosphere each year about 65 million tons of poisonous finely divided salt. It clubs reach heights a few kilometers and can be transported over distances up to 50 thousand kilometers reaching glaciers of the Pamir and Tien Shan and causing their melting. Extending to the west, they form over the Caspian Sea dust-salt clouds, the range transfer which generally not limited."

Thus the total flow from the bottom of the Aral Sea in atmosphere of sand, dust and salt is around 140 million tons. The heavy sand and large salty dust precipitate at the distance 800-1000 km. However, light dust and salt can spread almost all over the Earth's atmosphere. Therefore only due to Aral global flow of aerosols in atmosphere may be increased by more than 5%. Which is why not only near Tashkent, but in Lithuania as, and Belarus for the last years there has increase of salt concentration in rain water more than doubled, and directly beside dying sea - 7 or more once.

Considering the above-mentioned factors, should recognize that environmental catastrophe related with the drying Aral Sea is trouble not only peoples of Central Asia and Kazakhstan. This is a catastrophe of global proportions.

The swamp Moscow suburbs and marsh Arabs. Unfortunately, the Aral disaster - not only on the planet. In Moscow suburbs on huge territory Meshchera lowland often raging underground fires caused by draining of wetlands for purposes energy. Smog a few days turned Moscow into a clouded smoke metropolis. Suffocating smoke destroys health of muscovites. We ourselves created this problem, and now raises the question about restoration marshes with huge financial investments and material costs for preventing deterioration this environmental disasters. The similar, even more murderous decision was done by Saddam Hussein in the area between the Euphrates and the Tigris. Here, in favor dictator had been destroyed ancient civilization the marsh Arabs, which had existed here since time sumerians. "Having taken offense" at marsh Arabs for being they supported another religion, Saddam Hussein ordered to build huge dam and divert water supply of the swamp. As a result huge territory had been drained in 34 000 km² and a whole ethnos, numbering more than 300 000 people the marsh Arabs, was subjected to barbaric attacks with chemical weapons employment, resulting unique subethnos turned into environmental refugees, perished the whole centuries-old culture, the city of Baghdad and Basra lost the opportunity to receive high-quality fish, tens of species of migratory birds had forced to change routes, as was eliminated their interim parking disappeared reeds, purifying the water up to the level drinking standards.

Tragedy of Sevan. So, almost perished the Aral, on verge of extinction pearl of Armenia - alpine lake Sevan. The lake created by the efforts of millennial Mother Nature, not sagacious people forced once

to work for your needs. They girded cup's lake necklace young forests. Built sanatoriums and motels, organized beaches. The gray limestone bands, shining on mountain slopes, hanging over the water, also man-made. The waves even in stormy weather does not try to reach them, to wash away this lime leprosy. 28 rivers and streams falls into Sevan, and flows only one - Razdan. On Razdan had built six hydroelectric power stations: Kanaker, Sevan, Arzni, Atabekan etc. From 1933 to 1970 had been launched about 40% of the age-old water reserves Sevan. As a result level of lake dropped by 18 meters.

On account of perennial unwise exploitation of the lake turned into two large puddles, which in excruciating throes dying the world famous Sevan trout and other inhabitants of the water empire. The attempts to resuscitate this "blue wonder" given nothing yet.

In the late XX century and beginning of XXI century, positive trends to establish ecosystems of Sevan. In 1978, Sevan was declared a National Park. The serious research on conservation of the lake in 1981 finished the construction of under the Vardenis ridge tunnel length of 49 km, with an annual draining 250 million m³ water from the river donor Arpa into the lake. With the help of such measures as additional water flow and radical reduction outflow (water use for energy production was resolutely shortened) water level gradually risen. But unique water conduit only stopped falling level and does not solve the problem.

Muddy the Caspian sea. Greatest threat hung over great salt lake of the world Caspian Sea. Perhaps, the Caspian Sea became the first planet which has known destructive onslaught of industrial expansion after in 1873 in the suburb of Baku hit the first oil gusher. Then the whole city grew up Oil Rocks, then oil began to extract in Dagestan, Iran, Kazakhstan, the Caspian Sea had acquired factories and industrial productions.

Now there is a rise of its level, which led to flooding oil exploration wells drilled and associated oil contamination habitat sea animals, in particular the seals and mass of their death. But the local waters abounded unique species fishes - hausen, sturgeon, starlet, stellate sturgeon, whitefish [7].

The figurative expression journalists at coast the Caspian Sea, exposed flooding, and on the bottom of the Caspian laid down thousands of time bomb. This applies to Kazakh coast and northern part of the Caspian Sea, and to Dagestan coast, and possibly to Turkmen and Iranian part of the Caspian Sea.

Large volumes oil into the sea shall render Terek from Chechnya. Quite a few poisons carries in Caspian Sea and Volga rivers. Contamination threatens the entire water surface of closed-drainage basin. Biological resources are in danger emergency. Meanwhile the value of biological resources the Caspian Sea not comparable above the cost of oil.

The scientists still in the 80s last century have noticed that the level of the Caspian Sea is reduced, and this disaster is risked. If not promptly take drastic measures, the Caspian will perish as the Aral Sea. One more miracle water disappear or turn into a waste repository a different production.

Salinization of soils. Bugs in agriculture does not fit in any frameworks. Here, for example, the Karakum Canal. He breathed life into the desert and unpopulated land. We choked from delight reading victorious reports about our achievements. Indeed, the desert along the route of the channel has become in blooming oasis. But look carefully to ongoing processes. According to data a member of the Academy Sciences of the USSR Kovda V.A., for twenty-five years of use the Karakum Canal in Turkmenistan on area 80 thousand square kilometers were poured 225 m³ water. And the result?

Salinity, waterlogging and failure 372 thousand hectares of irrigated areas, shortage 400 thousand tons of raw cotton, the destruction of ancient grassland in Murghab and Todzhen oases, fourfold increase mineralization earlier supplied fresh water and much more. Such examples on objects of agriculture a lot.

Tragedy of Songhua and Argun. If we fast forward to East of Russia, then acquainted with another one of the greatest water-environmental tragedy. Along the border with Russia, Songhua River stand hundreds of industrial companies are not equipped with ecological Conserving buildings, and water straight from the river falls into Amur. For liquidation consequences pollution Russia more than once attracted not only the forces of the MOE, but army units [2].

November 13, 2005 Chinese chemical plant poured into Songhua more than 100 tons of benzene, which led to the defeat fish in the Amur River on 1 200 km above the dumping site. August 20, 2006 same factory dumped industrial waste benzene. July 28, 2010 flood waters washed in Songhua about 7 thousand. barrels with flammable explosive chemicals. In containers which blew from the territory local plant into the river, contained more than 160 tons of chemicals.

Russian-Chinese cooperation in the field of water management is regulated signed January 29, 2008 in Beijing the Agreement on rational use and protection of transboundary waters. Basic directions of

cooperation envisaged in the agreement, include development of unified standards and target indicators of quality of transboundary waters; promoting the use of modern technologies rational use and protection of transboundary waters; informing sides about programs and planned outputs, may lead to significant transboundary effects, prevent such impacts.

In addition, document provides content in appropriate technical condition existing hydrotechnical and other structures; carrying out of actions to stabilize the river beds and to prevent their erosion; monitoring transboundary water and data exchange about its results; carrying joint scientific research; cooperation in the sphere hydrology flood prevention at transboundary waters.

Implementation of the Agreement will contribute environmental security in Far East region, state of which soundly disturbs Russia in connection with rapid economic development northern border territories of China.

Anthropogenic pressure on border rivers from the Chinese side is very large. For example, China's share in general discharge of wastewater into the Argun River, flowing into the Amur, is 87.5%. On site of Amur, of the mouth of Argun up to the mouth Songhua, 75% of the discharged waste - Chinese, and in the Ussuri River their share - 97.6%.

Rough handling rivers, unwise water use negative impact on biological mode of Amur, destroy its life, will lead to degradation of transboundary ecosystem Amur basin. Amur, a large part of the basin which - 820 thousand km² - is located in limits of Chinese, plunges into environmental coma. On coast of Amur and its large tributaries situated thousands of populated locality.

At the same demographic pressures in the river basin from China exceed Russian 14 times. Only Harbin has a population of 7 million person. The considerable part of wastewater discharged unrefined or badly cleaned.

All cities and settlements from the Russian side have facilities by water treatment, although their power is not enough today. Require the expansion and modernization of the treatment facilities in Khabarovsk, Komsomolsk-on-Amur, Birobidzhan.

Amur waves. On planet remained only three large "free" river not baffled by dams in the main channel, and among them - Amur (length of 2834 km). It would seem not disrupted ecosystems, diversity of natural conditions and biological species must be conducive to prosperity all ecosystem of the Amur. But today not natural immunity, nor the power of natural self-regulation rivers no longer cope with that mode of life which foisted Amur River people.

This great river entering of the ten largest rivers in the world, forms the of water due to runoff, coming from territories of four countries - Russia (54% of the total area), China (44%) and to a lesser share - Mongolia and North Korea. Many thousands of years development of civilization in the North-East Asian river its waters gave to drink generations. Today Amur water is perfectly unfit for consumption. It is rather a dangerous chemical reagent poisonous cocktail of organic compounds, heavy metals, petroleum products, and all sorts of mechanical suspensions. The maximum permissible concentration of harmful substances in it exceed sanitary norms adopted by dozens of times.

Being the migration corridor and spawning ground for fish populations the richest Amur due to bad the quality of water already found ourselves short at least half of those biological (aqueous and semi-aquatic) species, which are registered in its ecosystem.

Dry Israel. It is considered that the large positive results water supply and development of alternative sources of fresh water reached Israel. Indeed, development and introduction of scale of is impressive. Israelis have successfully mastered drip irrigation and implement them even abroad, for example in Jordan. However for decision of a food programs and increase exports of fresh water these developments initiated back in the 70's are insufficient. The background of this we can talk about starting crisis of water management in Israel. For example, drought threatens Lake Kinneret (Lake Tiberias) - to the largest source of fresh water in Israel. The lake level is located at a critical point - 212 m. below sea level. Pumping out of more than in previous years, the amount water can cause irreparable damage lake (usually pumped about 400 million m³ water). In turn, the excess pumping of water from boreholes and wells coastal zone of Israel had violated balance of fresh and salt water. The fresh water disappeared and its place was taken salty sea water. As never there was a question search and development of new sources of water supply. Today is the stage of ideology to ensure reliable extraction of water and careful attitude to environment.

The scientist M.M.Yazmir proposed to create on the northern coastal shallow waters of the Mediterranean Sea, between cape Rosh- ha-Nikra and the town of Nahariya, an artificial lake and 3 km wide and 12 km long with a depth of 15 meters, reclaimed from the sea land protective dam. Pump out sea water and capture all rapidly flowing down into the sea rain water having accumulated in such a reservoir to 270 million m³. This idea has found its supporters and opponents, but the problem desalination of water and getting fresh water for drinking and irrigation extremely are relevant. All increasing volumes desalination of sea water will lead to the accumulation of salts deduced from sea water, and necessity of their warehousing which leads to deterioration environmental situation, and creation of alternative form in a modern Israel is very expensive.

Thus, all of the above actions do not solve problem of food security in individual states, as well as needs population of the planet as a whole, and pollution fresh water approaching a critical point. How with bitterness noted in the late XIX century, A.P. Chekhov in play "Uncle Vanya", "Man is endowed with intelligence and creative force to augment what given to him, but still he did not create, and destroyed. Forests less and less, rivers dries, wildfowl moved up, climate spoiled, and with every day land becomes poorer and uglier. "

Listed above negative phenomena, trouble, destructive processes constitute only a tiny fraction disasters, the collapse on our worldwide civilization to the expanses the planet. Part of the problem of fresh water have been highlighted in the book Shestakov FV "With water - without water" [8] and at international conference on Irrigation kariz in Urumqi 1990 [9].

More detailed list these negative phenomena examined in the expert-analytical report of group of scientists "Problems of fresh water. The global context of Russia's policy ", published in 2011, published by MGIMO [2].

The causes leading the planet to global water and environmental disaster: thoughtless wasteful attitude to this free gift of nature, pollution, chemical, agrochemical, industrial, municipal water, the lack of general development plan planetary of water use, ambition and thirst for profit of both individual states, and their owners, leading to armed conflict in struggle for access to water (and per 50 years of armed conflict human casualties totaled more than 500), the uncontrolled destruction huge forest areas of Amazonia and other places, and much, much more.

In the above expert report is offered as a preventive events creation suprastate international control agency with punitive and legal opportunities, independent from influence and pressures of the various states.

This agency should propose to introduce water conservation technologies, to prevent possible risks associated with intensive water use, which leads to increased wastewaterrisks related with ambitions developing countries, leading to armed conflicts and terrorist acts on nuclear power plants to desalt sea water, etc., conduct propaganda rational nature and water use and many other events allowing cherish and rational use existing water resources.

In spite of vastness proposed activities, they can not prevent water-environmental disaster, but only postponed this tragic end. The fact is that development civilization predetermine increase water needs of every member of the human society. If in Africa enough and 20 liters water a day, the amount of water satisfies the needs of wealthy members of society, approaching 2,000 liters water a day or more. The growth of industry with thirsty technologies continues and will continue. For decision of a food programs and food safety, many states continue to increase the volume of fresh water for agriculture. All these and other causes will exacerbate development of water famine. For more rapid decisiongrowing problems associated with fresh water, necessary another alternative source of fresh water.

One of these, the most studied to date sources is constantly renewed water vapor atmosphere. According historical information, this source ensured liquid water settlements of the ancient Greeks (Genoese) on the coast of the Black Sea still 25 centuries ago. [10] Their experience has been consolidated and in the basis of this forester Siebold FI was built condenser to get liquid water from water vapor in the atmosphere, known as the "Bowl Siebold" or "Air Siebold well", which gave up 432 liters water a day [11, 12] (study Siebold had been suspended because of the 1st World war).

According to some informationproject this source has been taken out during civil war in France from Russia, and on the basis it was built so called "Siebold bowl", which still operates.

Existing in Russia (Crimeamountain Tepe-oba at Feodosiya) "cup Siebold" partially destroyed, although its remains as already historical monument can be found today.

By this alternative source of water supply was trying to attract attention in 1929 E.K.Tsiolkovsky, who published an opinion in the article, "Water in dry and cloudless deserts" [13], where he led calculations for obtaining water from air in deserts and use it to ensure inhabitants deserted places.

The great prominence acquired so called condensing springs. To the possibility of their use in the economy attracted the attention of many researchers [14].

A lot of work for study condensation of water vapor in fracture-karst collectors was conducted Dublyansky V.N. For example, he proved purely condensation nutrition of the river, located 23 km from Simferopol [15, 10, 14]. The large works on studying condensation processes in glacial zone and the northern latitudes were performed by several researchers [16,14, 12].

The huge amount of work on the study of condensation processes in soils and ground-level, direct development of water from air was performed Lukin N.F., which relying on the works of his predecessors - Kostycheva, Kuznetsova, Blagoveshchensk, and many others - was finally able give right of citizenship condensation theory origin of groundwater. He also substantiated, and developed methods to increase exchange fund moisture in soils and methods of getting water plants without watering [17,18]. For last years a large volume of work was carried to directly receiving water from air different setups, which promise provide water as separate objects, and the whole city. Overview patents and inventions in this direction is given in the bibliography FV Shestakov, "Condensation of water vapor in soils and surface layer" [14], in which, in addition to these data, provides information about works on condensation of water vapor in the atmosphere starting from 1877 to 1987 y.y.

Relying on all of these materials, can be argued that the alternative source of fresh water exist and the keys to its use are in our hands. Development and assimilation it will release huge volumes fresh water use in agriculture for irrigation. The already developed mechanisms mastering water vapor in the atmosphere allow to include in new crop rotation now are not getting explored tracts of land in by the wilderness zones or zones where land currently not being developed because of the lack water. Development of a new water source will solve the problem of overpopulation due to human settlement in the new irrigated land. New source of water allows the most just decide the problem of soil salinity, as will be liquidated excess unproductive watering, leading to a rise groundwater and associated output of lands from agricultural use. Using a new source allow to remove risk of armed conflict and acts of terrorism associated with water. Getting water through the capacitors allows one to develop production water-related, in any place of the world. For development of this alternative source, of course, will require financial infusions into institutions that are developing receptions mastering water from air, government infusion, as the private sector loves quick profits. It is also necessary scientific baseintroduction in relevant institutions of the course "condensation of water vapor, and the development of methods of its development" and the immediate graduation of specialists of this profile and development of laws controlling use of this source water, as well as a wide promotion of new techniques and methods mastering water vapor in the atmosphere interstate level.

Using water vapor in the atmosphere allows liquidate many kilometers transferring water in pipelines disturb the normal development of the animal world, removes the problem of trade water as a product of international significance. The water from air is competitive for entrepreneurs doing business. Execution of plans search for new sources of water supply in context of increased needs clean water extremely difficult to implement, as it requires creation an environmental management system, in which to sum up to summary and discussion existing theories, hypotheses, judgments, speculative conclusions about the origins of natural waters. And these theories, during the development of our civilization accumulated plenty:

1. infiltration
2. condensation (the theory of "underground dew")
3. sedimentation (the theory of "the buried water")
4. juvenile
5. vadose
6. sea waters
7. steam spherical
8. transpiration (the theory of "metabolic water")
9. condensation water terrestrial depths ("magmatic water")
10. the space water
11. dehydration water and others.

Overview literature devoted possibility of using condensation water, done in the article Shestakov FV "condensational theory of - right to life".

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ӘЛЕМДІК СУ-ЭКОЛОГИЯЛЫҚ АПАТ ЖӘНЕ ОНЫҢ ПРОФИЛАКТИКАЛЫҚ ШАРАЛАРЫН ЖАҚЫНДАП

Ф. В. Шестаков

«ОБИС» ЖШС

Тірек сөздер: тұщы су мәселелері, су-экологиялық апат, жер асты суларының шыққан теориясы, атмосферадағы су буларының конденсациясы.

Аннотация. Тұщы судың судың тапшылығына алып келген Еуразияның ірі су және экологиялық апаттарына шолу жасалынды, олардың пайда болу себептері анықталынды. Шолуды негізге ала отырып, таза ас суының бірнеше көздерін іске қосу немесе қосалқы көздерін табу керектігі көрсетілді. Жерді осындай судың көзі ретінде алуға болады, яғни ғылыми зерттеулермен және тәжірибемен тексерілген үнемі толысып отыратын атмосфераның сулы буы. Осы табиғи судың көзін пайдалануды жолға қою су тапшылығының экологиялық мәселесін шешуге, су үшін әскери қақтығысты болдырмауға, терроризмнің қаупін бәсеңдетуге, адамзаттың тамақ пен су қауіпсіздігін жүзеге асыруға мүмкіндік береді.

ГРЯДУЩАЯ ГЛОБАЛЬНАЯ ВОДНО-ЭКОЛОГИЧЕСКАЯ КАТАСТРОФА И МЕРЫ ЕЕ ПРОФИЛАКТИКИ

Ф. В. Шестаков

ОО «ОБИС»

Ключевые слова: проблемы пресной воды, водно-экологической катастрофы, теории происхождения подземных вод, конденсации паров воды в атмосфере.

Аннотация. Сделан обзор крупнейших водных и экологических бедствий Евразии, были выявлены их причины, которые привели к дефициту пресной воды. На основе обзора существует необходимость поиска альтернативных источников или несколько источников производства чистой питьевой воды. Таким источником является земля и проверенный практикой и научными исследованиями метод использования постоянно обновляемой атмосферы водяного пара, которые позволят снять напряженность экологической проблемы воды, избежать военного конфликта по воде, снизить риски терроризма и решить пищевую и питьевую безопасность человечества.

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