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SECURITY POLITICAL ANALYSIS OF FRESHWATER POLLUTION IN VIEW OF HYDROCOOPERATIONS

Absztrakt/Abstract

A vízszennyezés napjaink egyik legsúlyosabb környezetvédelmi problémája. Tekintettel arra, hogy a víz minőségének romlása a felhasználható édesvíz mennyiségének csökkenését okozza, vízhiányos régiókban fontos biztonságpolitikai tényezőként jelenhet meg. A vízszennyezés azonban nem kizárólag a vízhiánnyal küszködő területeken jelent kihívást. A Földön egyre kevesebb ember jut egészséges ivóvízhez, és ezzel arányosan nő a szennyezett vízhez kapcsolható megbetegedések és halálesetek száma. Több ország által birtokolt vízbázisok esetében a vízszennyezés elterjedésének megakadályozása, és a probléma mielőbbi megoldása kizárólag közös együttműködések révén valósítható meg. Az édesvíz készletek minőségének megőrzése érdekében létrehozott hidrokooperációk elengedhetetlen feltételei a közös vízfelhasználás biztonságának.

Water pollution is one of the most oppressive environmental problems in these days. Regarding that the ruin in water quality leads to the diminution in the amount of freshwater, it can emerge as an important factor in security policy in areas short of water. However, water pollution means a challenge not only in such areas. Access to healthy drinking water is constantly decreasing on the Earth, and parallel to this phenomenon, the number of diseases and casualties related to polluted water increases pro rata. In case of water bases owned by several countries, prevention of the spread of water pollution and the earliest elimination of the problem can only be feasible by means of mutual cooperation. The hydrocooperations established to support the conservation of freshwater stocks' quality are indispensable provisos of the security of common water use.

Kulcsszavak/Keywords: vízszennyezés, hidrokooperáció, hidroszolidaritás, környezetvédelem, vízhiány ~ water pollution, hydrocooperation, hydrosolidarity, conservation, water shortage

INTRODUCTION

Water shortage, which has affected an increasing part of the Earth, has been becoming a more and more dominant risk factor for the security of the endangered regions. The problem of freshwater shortage is not solely represented by the practical lack of water. Living organisms, mostly humans can only preserve their health by consuming water of defined clearness: so besides quantitative conditions, claims on water from global water stocks also have qualitative conditions. The disproportionately vast appearance of polluted freshwater inadequate for human and animal consumption or agricultural utilization can result in the development, spread or deepening of water shortage risks.

According to UNICEF's survey, the number of people who have no access to healthy drinking water is more than 884 million in the developing countries, which gives more than 39 per cent of the population in Middle and Western Africa. [1] Regular consumption of polluted water can lead to various diseases. According to the standpoint of World Health Organization and United Nations, almost half of the Third World's population suffer from any of the contaminated water borne diseases. The different diseases having evolved due to of the lack of clear drinking water and the related basic hygiene affect almost 3, 34 billion people annually all over the world. [2] Nearly fifty per cent of the casualties are caused by infections, and thirty per cent of them are generated by diseases derived from parasites. Data and results are included in the Table 1.

The growing demand for water that has arised along with the population boom and urbanization, and beyond this, the fact that most of the developing countries still lack the basic water infrastructure network, all contribute to a great extent to the increase of water pollution. According to forecasts, in the next twenty-five years the number of those who lack adequate drinking water and drainage network can become doubled and the excessive environmental pollution will result in the becoming of a growing part of the seriously decreasing water stocks to be unusable. It is important to make the remark that water contamination means a security political risk factor not only as a possible root cause of water shortage. Two or more nations have to share most of our planet's surface and under-surface water stocks. In such a case, the qualitative conservation of the water resources is out of the sovereign state competence; thus the defence and safekeeping of the connected water bases become a common interest. Water pollution, which generally affects most or the whole of the given water networks, can influence water quality and the quantity of the utilizable drinking water of not only the polluting country, but also of the adjacent countries. The pollution of water bases can cause significant international problems even in areas rich in natural resources, and where they are scarcely present; it becomes a dominant security political factor.

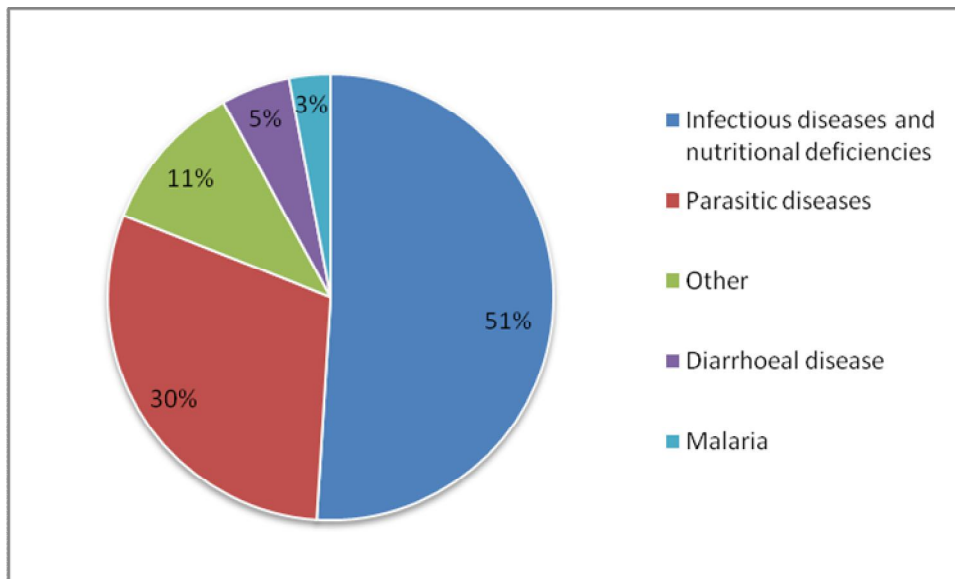


Table 1. Death rates from water-associated diseases in 2001

(Source: <http://www.un.org/waterforlifedecade/pdf/waterforlifebklt-e.pdf> downloaded 2010-06-20)

THE NOTION OF WATER POLLUTION AND ITS SECURITY POLICY APPROACH

There exist several conceptual definitions of water pollution. In security political approach and analysis, several elements of different definitions are worth heightening. Based on these, one of the most important determinants of water contamination is that it evolves as a result of anthropogenic functions, so they are induced directly or indirectly by humans themselves. It means such a negative change in the natural water's quality which besides increasing the concentration of dangerous materials also has a harmful effect on its consumability for humans. Water contamination can expand to each and every natural form of water appearance, i.e. still and running waters and also under-surface water stocks. Accordingly, in case of the commonly owned water bases, water pollution can be a phenomenon fraught with serious threats. Regarding the fact that it is induced by anthropogenic functions and thus human intervention can be ascertained, the responsibility of the polluting country becomes obvious. In dependence of the extent of pollution and the hydrological conditions, it can expand to most of or to the entire water basis and the deterioration of water quality may threaten other natural water bases. In this sense, it may be practical to approach the classification possibilities of water pollution firstly in view of the size of the affected water bases. By reason of this, local, fluvial (affecting the given aquifer), regional and continental extensions of water pollution can be distinguished. [4] With most of the countries, local water pollution is the one that can affect the natural water's quality of the neighbouring countries in the least. At this level, the developed problem can be solved on state or even on local authorities' level, as far as possible. In cases of fluvial, regional and continental contamination, along with the growth of the expansion, the number of the affected countries may grow in direct ratio. The common water monitoring, environmental and disaster recovery agreements of the countries constrained to share the water basis have come to the front; these play an important role in the finding the earliest possible solution to the problem. In case of countries that are not on friendly terms or even hostile with each other due to other reasons the security risk of water pollution grows worse. It can emerge as

an aggravating factor if the catastrophe appears on water-scarce areas, or if the lack of adequate financial conditions ends up in operational incapacity.

Other important defining elements of water contamination are the various human activities. The anthropogenic processes that contribute directly or indirectly to the decay of freshwater quality may be derived mostly from communal, industrial and agricultural functions. Due to the effect of population boom and the urbanizational process, near half of the world's population dwell in cities today. High population clustered in disproportionately small area severely burdens the environment of the affected settlements. Due to poor drainage network and the unbuilt status of sewage farms, certain proportion of megalopolis' communal wastewater gets in the environment uncleaned; and thus back to the natural water bases. A good example to the above mentioned facts is that in Mexico City, that of population over 20 million, despite having twenty-seven different sewage works only ten per cent of all communal wastewater is cleaned. [5]

The population boom and the urbanization have also resulted in the growth of industrial and moreover in agricultural productivity. Industrial functions take the greatest responsibility in terms of decay in freshwater quality. Industrial sewage, oil and radioactive pollution and contamination resultant of the leakage form undersurface pipelines and containers considerably endanger the quality of freshwater stocks. For air pollution and the consequent acid rains, which are also fundamental elements of our planet's water circulation, industrial emission is to take the blame in the highest degree. The chemicals applied in order to increase agricultural productivity get into the natural water systems mostly by means of wash-off and erosion. The eutrophication process which intensifies due to the effects of fertilizers and other substrates endangers the lakes in the following rates: 54 percent in Asia, 53 per cent in Europe and 48 per cent in North-America. [6]

Water political approach requires to mention also the geographical classification of natural body of water. Previously the fact that water pollution affects the quality of both surface and under-surface water bases was already referred to. The two forms of appearance of the surface water stocks, i.e. the running waters and stagnant waters react to water pollution in very different ways; however, in the present case, examining how the pollution spreads is the matter of prime importance. Regarding surface freshwater stocks, certain water flows can reach most of the countries, eminently, considering that in the river systems, any of the tributaries can convey the contamination to the main river flow. In this respect, the most severe risk policy factors of water flow systems are the fast spread of the pollution and expansion of the affected area. Surface still waters and water courses are in close hydrological relationship with each other. Many countries can share one common stagnant water; however, in the spread of the pollution the feeding and downcomer rivers play the most important roles.

The pollution of under-surface water stocks can run various risks. On the one hand, under-surface water stocks, that give a significant amount of the Earth's drinking water reserve, may appear under such geographical areas which hold under-surface water stocks scarcely or do not hold at any all. On the other hand, due to their locations, such water stocks are now examined whose cleaning and neutralization from contamination is difficult or is far not soluble. Further problems arise from the fact that these water bases run under several countries' borderlines and they may be in direct contact with surface water stocks, so they can have an impact on their quality, too.

In the following sections, the possible security political factors of water pollution are presented by enumerating specific examples, principally emphasizing the importance and necessity of hydrocooperation and hydrosolidarity in the affected regions.

PROBLEMS WITH WATER POLLUTION IN THE RUSSIAN FEDERATION

Basically, the Russian Federation does not belong to those countries that suffer from water shortage. However, certain peculiar economical, sociological and political processions and changes have their effects on the water circulation and water stocks' quality of the water circulation even in the largest country on Earth. Above it is demonstrated that the high rate of urbanization entails significant burdens for the cities' environment. In 2000 the Russian Federation 110,9 million people out of the population of 147,7 million in the Russian federation were urban citizens and according to certain estimates, this number will have been increased to 122,8 million by 2020. [7] The situation is worsen by the fact that the population does not spread evenly in the country, but 80 per cent of them are concentrated in the European areas and nearby the Caspian Sea. Consequently of this, industry and agriculture are also concentrated to these areas, which is clearly shown by the fact that almost 70 per cent of the the watered areas lie on the European parts. On the urbanized and industrialized areas, there can only 8 per cent be found of the natural water flows that otherwise provide the preponderant amount of the country's water stock. In both terms of water pollution and water taking may the affected rivers be regarded as threatened ones, mainly knowing that in case of certain water flows even half of the water runoff gets exploited. [8]

Up to these days, water pollution has become one of the crucial environmental problems of the Russian Federation. Quasi fifty per cent of the surface waters does not meet the basic water quality requirements, and 30 per cent of the under-surface water stocks is intensely contaminated. Less than half of the Russian population have access to healthy drinking water so the need for a solution to this problem has been becoming more and more urgent at all levels. [10]

Since 1991, when The Soviet Union collapsed, springs and tributaries of many natural water flows of the new Russia have come to the territories of the newly independent countries and has had to share some proportion of the surface stagnant waters and the under-surface water stocks. The prevention of occasional water contaminations affecting the water bases has grown from being a home affairs problem to be a joint foreign affair interest, which raised the question of the necessity of establishing hydrocooperations. The previous cooperational contracts between the former Soviet Union and its neighbours affected in the above mentioned matter generally involved different water policy issues; so did the agreement between U.S.S.R and the government of Turkey in 1927 and the 1964 Soviet-Polish agreement. The water treaty that was signed by Hungary, Romania, Yugoslavia and the Soviet Union in Szeged in 1986 intended to prevent the quality decay and contamination of the entire Tisza River.

The first multilateral water agreement after the dissolution of the Soviet Union was established among Kazakhstan, Uzbekistan, Tajikistan and Turkmenistan in 1992, with the help of which the Middle Asian hydrocooperation was successfully founded. Besides the agreements, the water stocks divided by the new borderlines generated several debates in the affected region. The industrial fields and water power-plants set on the upper flow of the water may cause such a grade of contamination that makes field watering impossible on the lower part of the waterflow. In case of Kura River that enters the Caspian Sea, for the similar situation that has evolved among Azerbaijan, Armenia, Georgia and Turkey, the establishment of hydrosolidarity hasn't been managed yet; which fact, by lacking the development of the adequate monitoring system, may denote the aggravation of the problem. [11]

Towards the protection of interboundary natural water stocks the most significant breakthrough was the agreement in Moscow in 1998 which was established among the

Russian Federation, Belarus and Tajikistan. Under the terms of the cooperation, regarding the environment, a common provisional system was introduced and the signing countries assumed an obligation to avoid any further activity that may negatively influence the quality of the water bases that are in dispute. However, Russia has to endeavour to enter into similarly good water political relations even with those of its neighbours that were not parts of the former Soviet Union.

In my opinion, the water and environmental series of agreements made during the 1990s apropos of the transboundary Khanka Lake running alongside the Russian-Chinese borderline clearly indicate the line of bearing that the Russian Federation has to follow towards the protection of the common water bases' quality. Khanka Lake is the largest surface freshwater in North-East Asia, which is fed by fifteen and eight rivers from the Russian Federation and China, respectively. [12] In the immediate surroundings of the lake sensitive and unique for its hydrological features and natural flora and fauna there live 620 000 people, almost 70 per cent of whom are urban citizens. The freshwater stock is utilized with various purposes, however, a crucial part, almost ninety-five per cent of it serves watering. [13] Several factors played their roles in the qualitative decay of Khanka Lake's water. In the cities built in its surroundings besides the low degree of sewage treatment and the different washed-in and infiltrated chemicals the industrial and mining functions on the Russian side contributed to a great extent to the contamination of the stagnant water. The fast degradation that got under way both in water's quality and biodiversity caused serious problems on both sides. At first, the parties handled the critical decay in natural still water's quality in their own scopes of authority. Later they had to realize that solely within their own borders, at state level they would not be able to treat this problem.

In order to avoid the conflict, the Chinese and the Russian party agreed on establishing a common program for water defence so as to sustain Khanka Lake as a usable freshwater stock for the inhabitants. On the Russian side the industrial and agricultural operations became reduced, towards less population resettlements were carried out and 80 % less water was used for watering. [13] Parallely with this, the Chinese tried to moderate the further pollution of stagnant water by building sewage farms and the connected drainage system, allocating reservations, and also by means of stricter legal regulation. The appropriate monitoring stations were established, among which the adequate and regular flow and exchange of information also mean an important part of the efficient cooperation.

The Russian Federation has to give priority to the conservation of its natural water stocks' quality. The country's population figures show a decreasing tendency to which, besides low standard of living and other setbacks, and to a certain extent unfavourable environmental circumstances also contribute. The water policy agreements made among the former states have to be renewed so thus enabling them to manage their current problems, too; and with the other neighbours, efforts have to be made for setting a similarly functioning hydrocooperation.

TIBERIAS LAKE: THE NECESSITY OF HYDROSOLIDARITY IN THE NEAR EAST

In the Near East region, on the territory of Israel and its neighbouring countries, due to the the scant freshwater bases the fresh drinking water sources gain a valorized role. In the areas of water scarcity the decay of water's quality and the spread of the dross may denote critical secure political risk. In case of Israel and its neighbours, the situation is worsen by the fact that due to serious historical conflicts, the relationship of Israel and its surrounding countries have become quite disaffected. The necessary establishment of hydrosolidarity is further complicated by the fact that previously Israel got into such military

conflicts in which the seizure of strategic water stocks played its role. I suppose in the Palestinian West Bank issue there have been certain water political controversies still present, which contribute to the block of the peace processes.

As for water pollution, it is important to heighten the water policy issues related to Israel's sole extended surface stagnant water, namely Tiberias Lake. The lake's water stock provides almost fifty per cent of the Jewish state's drinking water, so conservation of its quality is a task of high importance. [14] In view of the fact that the main source of Tiberias Lake is Jordan River, whose tributaries originate from Lebanon, Syria, and Jordan; Israel by all means has to found certain water political cooperations. After the 1949 allocation of the armistice demarcation lines Tiberias Lake got entirely to Israeli territory, so the multinational hydrocooperations should be set primarily as confined to the feeding rivers.

In the affected area hydrocooperation had been rendered more difficult by earlier water strategic oppositions. In the 1950s and 60s Syria and Israel made several efforts to divert the flow of River Jordan's tributaries, thus significantly cutting down on the amount of freshwater that empties in Tiberias Lake. Israel, which had to supply its growing population and economy, in the early 1960s, started to build its water transfer network that extends to the southern Negev Desert; whose water-taking offended the northern neighbours' interests. The oppositions that sharpened in small conflicts and in the six day war of 1967; during which the Jewish state managed to strengthen its water strategic positions in the Middle Eastern region. In view of Lake Tiberias it seems to be fundamental to emphasize that during the war Israel gained the control over the Golan Heights, so Jordan River and its main tributaries got under its authority. Seizing the water bases owned great significance not only for the sustenance of water stocks but also for the assurance and control of their quality.

One of the most important tributaries of the Jordan River that feeds Tiberias Lake is Yarmouk River which is shared by three countries: Israel, Syria and Jordan. There were agreements established on Yarmouk River between Jordan and Israel in 1953 and 1987, but these targeted mainly the importance of the building the barrage over the river, the utilization of the water for plant watering and the common water share. Conservation of water quality also got to the background, most notably, if considering that in terms of the agreements several industrial facilities and brrages were built along the river. [15] The 1994 Israel-Jordan Treaty of Peace, a separate Article of whose includes the agreements on water resources of Jordan River and Yarmouk River, involves projects regarding the quality of water. The assurance of the exchange of environmental information, the establishment of monitoring stations, the protection of common water bases and the defence of the other party's water network were discussed in the treaty of peace; which was a significant development in the region. [16] The importance of the agreement is proven by the fact that in 2009 Jordan claimed a compensation to be paid by the Jewish state, viz. considerable oil and other contamination had been noticed in Yarmouk River, which had originated demonstrably from the Israeli banks. [17]

The quality of Tiberias Lake and the related water systems is threatened by several anthropogenous processes. The agriculture, communal sewage and litter, fishing and vast tourism of the sorroundings all contribute to a significant extent to the contamination of stagnant water. The situation is worsen by Jordan River being not only feeder but also by-passer of Tiberias Lake whose water is utilized by both Jordan and Israel. Towards South the river empties into The Dead Sea, towards the protection of whose clearness and environmental assets a bilateral cooperation have already been made among Israel, Jordan and the Palestinian Authority. As for the utilization of Tiberias Lake it is momentous to note that the Israeli Water Authority indicated the lake's critical tides with red and black lines. The red line means the moderation or suspense of water-taking, and in case the tide of the lake

declines under the black line, it would draw irreversible environmental disasters as a consequence. [18]

The water networks of Tiberias Lake and Jordan River are indispensable water resources for Israel and the neighbouring Arab states. Besides the agreements affecting water-taking and water division, by all means, regarding also the protection of the quality of the water, significant improvements are necessary to be made. The technologically and institutionally more developed Israel has to strive for its enhancement of the environmental development of the surrounding countries; in which the establishment of the common-interest based cooperations play a significant role.

CONCLUSION

Besides the quantitative regulation of the global freshwater stocks, more and more emphasis should be laid on the conservation of the quality of the existing water bases. The different forms of contamination can make the resources unhealthy and unusable, which may result in new risks to evolve. Considering that most of the water bases are blighted to be shared by several countries, in most cases water pollution is a source of risk affecting a part or the whole of the given water system. In areas of water-scarcity the given problem appears revalued, since the defence and protection of the scant resources is an important risk factor, principally if other areas show different conflicts of interest. In the future an increased attention should be paid to the appointment and configuration of these countries' adequate preventional and cooperational projects, whose basis will be the common interests and hydrosolidarity.

Moreover, in the future, besides the division of water stocks, the hydrocooperations will have to be extended also to other projects related to the issue of water pollution. Beyond the establishment of common monitoring stations, the continuous exchange of information and the common damage prevention tasks, the prospects for sanctions should also be drawn onto legal basis. As far as possible, the water political cooperations should be extended to the entire water system that is affected, since the non-signing country may be able to cause a pollution in most of the water base. A good example to this is the Nile Basin Initiative that was established for the division and the protection of Nile's water stock and which can take substantive steps only through a cooperation of all of the Nile countries.

Water pollution may be a source of risk not only in the regions scarce in water. As for Hungary, the Austrian pollution of Rába River or the diplomatic conflict that evolved when Tisza River was polluted with cyan in 2000 is an instance to recall. Both instances clearly show that in a region similar to Hungary's great attention is to be paid for the protection of the common water bases, and to the opportunity to effect the evolved problem in the early phase of its spread. The bases of reducing risk are the recognition of own responsibility and the introduction and installation of joint cooperations for prevention and averting, in pursuance of which the conservation of freshwater stocks' quality will be a global project in the future.

REFERENCES

- [1] <http://www.unicef.org/wash/> (2010-06-18)
- [2] <http://www.gdrc.org/uem/water/water-crisis.html> (2010-06-18)
- [3] <http://www.indepthnews.net/news/news.php?key1=2010-03-22%2002:13:23&key2=1> (2010-06-18)
- [4] Thyll Szilárd – Vízszennyezés – vízminőségvédelem (Egyetemi jegyzet) - <http://gissserver1.date.hu/thyll/vizszenny-vizmin/tartalomjegyzek.html> (2010-03-16)
- [5] <http://casestudies.lead.org/index.php?cscid=146> (2010-06-20)
- [6] Wilhelm Rodhe – Crystallization of Eutrophication Concepts in Northern Europe – Washington, 1969. – ISBN: 309-01700-9
- [7] Ward Kingkade – International Brief Population Trends: Russia – <http://www.census.gov/ipc/prod/ib96-2.pdf> (2010-06-20) U.S. Department of Commerce, 1997.
- [8] https://docs.google.com/viewer?url=http://www.icid.org/v_russia.pdf (2010-06-27)
- [9] <http://www.country-data.com/cgi-bin/query/r-11390.html> (2010-07-03)
- [10] http://www.dni.gov/nic/special_russianoutlook.html (2010-06-27)
- [11] Ministry For Natural Resources Of The Russian Federation – Transboundary Water Cooperation In The Newly Independant States – Moscow-Geneva, 2003.
- [12] <http://www.worldlakes.org/lakedetails.asp?lakeid=8619> (2010-07-03)
- [13] Jin Xiangcan – Lake Xingkai/Khanka - http://www.ilec.or.jp/eg/lbmi/pdf/28_Lake_Xingkai_Khanka_27February2006.pdf (2010-07-03)
- [14] Moshe Gophen - Water quality management in Lake Kinneret (Israel): hydrological and food web perspectives - http://www.iii.to.cnr.it/publicaz/JL_62_supl/11_Gophen.pdf (2010-07-03)
- [15] Advocate Jitzchak P. Alster - Water in the Peace Process: Israel-Syria-Palestinians - <http://www.intjewishlawyers.org/main/files/Justice%20No.10%20September1996.pdf> (2010-07-04)
- [16] Treaty of Peace Between The Hashemite Kingdom of Jordan And The State of Israel - <http://www.kinghussein.gov.jo/peacetreaty.html> (2010-07-04)
- [17] <http://www.greenprophet.com/2009/03/20/7695/israel-jordan-polluted-rive/> (2010-07-04)
- [18] Jerusalem Post - Lake Kinneret water level dips below 'Lower Red Line' - <http://www.jpost.com/Home/Article.aspx?id=106767> (2010-07-05)