

THE TIMELY ISSUES OF SHARING AND UTILIZING THE WATER DISCHARGE OF RIVER NILE

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Abstract

The conflict and dispute on the issue of distribution and utilization of the water discharge of Nile River has been increasing among ten African riparian countries which are all affected by this issue, however each of them in different extent and way. All of them strive for asserting their own economic and security interest. The impacts of this issue extend far beyond the direct geographical region itself, and of course, it has a predominant influence on the water and food supply of around 300 million people who live in these countries. The sharpest disaccord can be seen between the group of Sub-Saharan riparian countries laying in the upper part of Nile and Egypt. The rapidly growing population and her almost exclusive dependence on the Nile-water makes the Egyptian government insist strongly to her quota, which was set in international agreements long ago. The Sub-Saharan countries would amend the prevailing sharing system to another solution which served their interests more, so they considered it more rightful. The international community has been trying to make efforts to settle the issue the best known of them is the Nile-Basin Initiative (1999) which is backed by international organizations like the World Bank, UNDP, etc. The aim of the research was to analyze this complex situation and draw conclusions and lessons which should be regarded in cases of analogue European situations, for example in case of the co-operation among countries in Danube Basin.

Key words

Nile. Water management. Agriculture. Hydro-energy. Conflict prevention

Introduction

The paper gives an insight to the increasing conflict and dispute on the issue of distribution and utilization of the water discharge of Nile River among ten African countries namely Burundi, Egypt, Ethiopia, Kenya, Democratic Republic of Congo, Rwanda, Tanzania, Uganda and Sudan (the latter was split to two independent countries in 2011). This issue has a predominant influence on the water and food supply of around 300 million people who live in these countries but also a way for electric power generation at a sustainable way. The problem is that needs for water, food and energy are all increasing while the resources are limited. The paper tries to focus on the point that this very complicated issue is not just a zero sum game for the riparian states but choosing the way of co-operation instead of conflicts may be beneficial for all stakeholders.

Materials and methods

The paper was based on secondary research founded on the descriptive-analytical exploration of concrete economic, social, political and technological factors, which could be found in the background of the entire complex situation. The examinations were based on the available international and partially Hungarian bibliography, and databases in this field. Mention should be made about the fact that the author not only visited but and even used to work in several riparian countries, therefore his on-site personal contacts, work experiences and his formerly published papers related to this field (Neszmélyi 2010, 2013) also contributed to the results of this paper.

About the Nile Basin in nutshell

River Nile is one of the longest rivers of the world, its length is 6,667 km, its catchment area is 3.37 million km² (somewhat bigger than the total territory of India). Nowadays Nile has a decisive or at least a very significant role in feeding and supplying 11 countries and their 300 million inhabitants with water. These countries are as follows: Egypt, Sudan (North and South – the latter became independent in July 2011), Ethiopia, the Democratic Republic of Congo, Kenya, Tanzania, Uganda, Rwanda, Burundi and Eritrea. The latter is not riparian country but the catchment area of the Nile extends to Eritrea as well.



Figure 1. The countries of the Nile River Basin

Source: www.pislamonauseacentral.blogspot.hu. 2013

On the basis of forecasts the population of the river basin of Nile will be doubled between 1995 and 2025. The prevision of the annual flooding periods of the river is cumbersome, the quantity of the surplus-water discharge varies from year to year, and it is also difficult to estimate in advance. From among the eleven countries from the aspect of the Nile the following countries have special importance: Egypt, North and South Sudan, Ethiopia and Uganda (these ones are most concerned by this issue) while in the water supply of the other Sub-Saharan countries the Nile plays a lesser decisive role.

Nowadays for 95% of the population of Egypt (around 85 million people) the water of Nile has vital importance. Inhabitants of Sudan and South Sudan are also strongly dependent on the water discharge of Nile. 86% of the water discharge reaching Aswan, the city in South Egypt derives from Ethiopia (Blue Nile) while 14% (White Nile) comes from Uganda and from other Sub-Saharan countries (Shinn D H 2006).

Table 1. Main statistical figures of Nile Basin countries

	Territory 1000 km ² ***	Population (Million) 2011	Annual population growth (%) 2011	Annual GDP growth (%) 2011	Per capita GDP (USD) 2011	Cereal prod. (Million tons) 2011**
Egypt	1,000.0	85.3*	1.88*	2.0*	6,600*	21.8
Sudan (North & South)	2,500.0	34.3	2.1	4.7	1.435	2.9
Ethiopia	1,100.0	84.7	2.1	7.3	357	20.0
Uganda	241.0	34.5	3.2	6.7	487	2.8
D. R. Congo	2,344.0	67.8	2.7	6.9	231	n.a.
Kenya	580.0	41.6	2.7	4.4	808	3.8
Tanzania	946.7	46.2	3.0	6.4	532	7.1
Rwanda	26.3	10.9	3.0	8.3	583	n.a.
Burundi	27.8	8.6	2.3	4.2	271	n.a.
Eritrea	117.6	5.4	3.0	8.7	482	n.a.

Sources: Data of World Bank (* Published by CIA, estimated data for 2012-2013,

** FAO data *** One World - Nations Online Countries and Territories in Africa

The Background of Conflicts

The possession of natural resources, the externalities appearing closely with them many times could be from the beginning the sources of economic disparity. Series of historic examples prove that for the possession of the existing natural resources, for the dispossession of new ones, numerous wars had already been launched. One of the most fundamental economic challenge of our age is that how could we utilize and divide our limited resources more equitably beside some sort of rational comprehension, how could we minimize the negative externalities in such a way that the possibilities of war conflicts should be avoided. (Lökös L Jr. 2009).

The complexity of the African problems especially the historic inheritances and traditions living deeply in the societies, the modernizing new (nation)state-structures and the global impacts and expectations from the international community are all inter-related with each other therefore multi- and inter-disciplinary approach of research and analytical considerations are needed. (Tarrósy I 2009).

The shortage of water becomes more and more the gravest risk factor from the point of food security of the world. According to pessimistic scenarios 66% of the population of Earth will not have sufficient quantity of drinking water by 2025. Out of the gravest problems

to be solved in the 21st century unanimously will be the permanent water pollution and the threatening water shortage (Glied V 2008).

These problems appear especially sharply in this huge region which is strongly heterogeneous both in terms of ethnic and religious characteristics, and also in the level of economic and social development. There not only the impacts of human activities but geographical and climatic factors are also among the reasons why a significant part of the water discharge of the Nile „disappears” and never reaches the Mediterranean Sea. The basis of the emergence of a conflict situation is that the riparian downstream countries (first of all Egypt) are strongly dependent on the water discharge of the Nile and on the other hand they sufficient power in their hands to enforce their interests against the upstream countries (Shinn D H 2006). The forecast of Worldwatch Institute (published in 1988) had already pointed out that a global scarcity of water „would belong to the most decisive ones from the lacks of raw materials which had been underestimated even by now at the eve of the third millenary”.

Concerning the water shortage the following trends can be observed:

- The overall demand for water has tripled since the beginning of the 20th century,
- In global dimensions essentially bigger amount of water is exploited than the precipitation can supply back.
- The level of groundwater is sinking rapidly in every continent.
- The freshwater quantity used by agriculture (around 70%) even at stagnant level of productivity is still the biggest ratio globally (Glied V 2008).

Egypt would require even more water in the future with regard to her rapidly growing population, developing economy and agricultural projects, however the Sub-Saharan (upstream) riparian countries would also need water in a growing extent. Furthermore they consider the present share of Egypt unjust to which Cairo consequently and strongly insists referring to international agreements which were concluded several decades ago in the past. The government of Egypt – as it has previously done during the Mubarak-regime and following to the Arab Spring too she also rigorously insists to her share of water discharge and does not want to renounce from any part of it in favour of the concerned other countries.

The majority of the upstream riparian countries at the same time also wish to utilize more water from the Nile before the river reaches Egypt. Ethiopia – from economic, population and military aspects – in the issue of the Nile the greatest Sub-Saharan „counter-pole” considers no any country can impede that it should utilize the water amount being in her territory. The available amount of water is limited, the water demand arising from the concerned countries is growing. The emergence of conflicts can be considered as a real risk, therefore international efforts being done for prevention are of vital importance for the future of the region.

International Agreements

Egypt and Sudan concluded first agreements on the distribution of water discharge of river Nile. In 1929 an agreement was concluded between Egypt and the United Kingdom according to which Egypt was entitled for an annual water quantity of 48 billion cubic meters while Sudan was eligible for 4 Billion m³. In 1959 a new agreement was signed, this time between Egypt and Sudan again which increased the quota of Egypt to 55.5 Billion m³ while it for Sudan 18.5 Billion m³ (proportional division of 3:1). The agreement reckons with an annual evaporation loss from the common Lake Nasser (Shinn D H 2006, Havasi E 2010). These agreements divided practically the entire water discharge between two states, therefore

none of the other riparian countries signed these agreements. The basis of disagreements existing even today and the impediment of a solution being acceptable for all parties – in the past and even now as well - derives from the different approaches to the issue.

The principle of “just or equitable sharing” is represented by the upstream countries who urge on the repartition while downstream states insist rigorously henceforward to their quotas based on their “historical rights and the international law”. On 14th May 2010 in Entebbe (Uganda) 4 countries (Uganda, Ethiopia, Rwanda and Tanzania) concluded a new agreement which intended to assert the standpoint of the upstream riparian states. This agreement was later joined by most of the Sub-Saharan riparian states while Egypt and Sudan kept off, Egypt even declared this agreement illegitimate. The only issue Egypt would be willing to negotiate is the sharing of the surplus water accessible from decreasing the vast evaporation and other losses of the water of the Nile.

Agricultural Aspects

Agriculture is the most excessive water utilizer in the countries of the region. Irrigation has decisive importance first of all in Egypt and in the northern part of Sudan where the climate is very dry thus without irrigation no agricultural production could be possible. Formerly several dams respectively hydro-power stations were built in the valley of Nile, among which the best known was the Aswan Dam in Egypt. Attempts to regulate the river in order to reserve water and to diminish the harms of floods have already been made at the beginning of the 20th century. The construction of the first dam began in 1899 in the distance of 5 kilometres from Aswan city under the guidance of engineer Sir William Wilcocks. The dam was composed of granite blocks the height of which was about 35 meters in a length of 3 kilometres. However, the dam which was ceremonially inaugurated on 10th December 1902 did not solve the problems even if between 1907 and 1912 there were attempts to raise the height of the dam, its capacity was still insufficient (Az első asszuáni gát... 2007).

The second or the so-called New Aswan Dam was under construction during 11 years with the technological and future financial assistance of the former Soviet Union. The dam, which was completed in 1971 is 111 meter high 3.8 kilometres long, the width of its fundament is 975 meters and going upwards it gets shrunken to 40 meters. The water of Lake Nasser (which is 480 km long and extends to 5,250 km²) - beside irrigation – played also important role in drinking water supply as well. It saved millions of Sudanese people of death of thirst during an extremely dry period between 1984 and 1988 (Tarján M T). The water regime of the Nile became more equalized since the dam system decreased the impacts of the significant fluctuation of the water discharge. The annual average of water discharge of the Nile is 84 Billion m³ the maximum is 150 Billion m³ while the lowest discharge is only 40 Billion m³ (45 éve épült... 2005). In spite of all benefits the construction of Aswan dam had numerous negative consequences for the Egyptians, however the arising problems and without an adequate solution they are threatening by ecological disaster already in the 21st century. First of all, by the artificial closure of the water rarified the biosphere of the Nile and this had a negative impact not only on the fishing-villages but even on the coastal area of the Mediterranean Sea. Even worse consequence was that by the regulation of the flood the previous floody areas lost the sludge and silt which was rich in nourishment and refreshed the fertility of the soil every year. This and the extensive irrigation accelerated the sodification and the deterioration which cannot be made up for by artificial way without consequences meanwhile the annual average yield is always decreasing. The damming up of Lake Nasser turned to be harmful from hygienic aspect too as parasitic organisms spreading bilharzias

illness multiplied rapidly. The Aswan Dam in spite of all its benefits charged the price of the economic prosperity, and even if there is no doubt about its usefulness it cannot be stated that it solved completely the environmental and economic problems of Egypt (Tarján M T). Egypt launched several new agricultural development projects (e.g. in the northern part of Sinai Peninsula and also in Toshka region of Upper Egypt). But with the connection of the so-called Salaam Canal (transporting water under Suez Canal) Egyptian demand for water might be increased by 4.4 Billion m³. Following the completion of the planned New Valley Project (2017) the annual water demand could be increased by further 5 Billion m³. The annual use of water in Egypt grows rapidly (see Table 2) while the amount of water discharge can be calculated constant.

Table 2. Annual water demand and utilization of economic sectors of Egypt
(Billion cubic meters)

Year	Irrigation	Households	Industry	Others	Demand total	Available amount of water	Difference
1997	48	4.5	7.5	3.0	63	65	2
2025	64	7.3	9.5	2.2	83	65	-18

Source: Reda M.A. Hassan, Nasr T.H. Hekal, Nader M.S. Mansor (2007)

The rapidly growing Egyptian population is a significant consumer of wheat (136 kg/person). Egypt has been importing between 6 and 11 million tons of wheat annually and in addition to this also other cereals (like 4-7 million tons of corn) for the recent ten years. In comparison to this, Ethiopia - which has similar territory and population to Egypt - imported just 0.3 – 1.3 million tons of wheat during the recent 10 years and almost no corn (Index Mundi 2013). Therefore and also due to the lack of sufficient natural precipitation it is a question of vital importance for Egypt to increase her agricultural activities based on irrigation. Sudan actually irrigates altogether 1% of her arable lands but plans to launch significant development projects. In case of concluding agreement between the two states of Sudan it will be possible in the future to complete the construction of the so-called Jonglei Canal which may transport even 5 Billion m³ from White Nile to the biggest freshwater marshland of the world. The construction of the 350 km long canal started in 1980, however in 1984 the work halted. It is not a hap hazard event therefore the concerned Sub-Saharan countries generally look at the large-scale irrigation-development projects of Egypt and Sudan with aversion while the efforts for agricultural development of the Sub-Saharan states are considered by the former grave risk factor of national safety from their point of view. Ethiopia proceeds irrigation farming on about 200 thousand hectares (Doran D 2009, Shinn D H 2006). This – in comparison with the number of population and respectively of the dimension of the country - cannot be considered too much.

Just then, by the end of the civilian war then pursuant to the battles with Eritrea the Ethiopian economy started to grow, the booming population caused proportions. Therefore the government in Addis Ababa announced that it has the intention of constructing 200 dams on the Nile by which utilizing 500 million m³ water from the river for irrigation and for electric power generation. Ethiopia, several times proclaimed her interest to increase agricultural yields which would take 3.7 million hectares of land for irrigation based agriculture with the view of the elimination of starvation concerning nearly 3 million human

beings. These projects planned by the government of Addis Ababa would cause in total a decrease in water discharge of 15% (Glied V 2008).

Kenya, Uganda and Tanzania altogether plan to develop agricultural areas of 400 thousand hectares (Shinn D H 2006). Tanzania launched a project of 28 million USD in February 2005 to take more drinking water from Lake Victoria. After completion of this project the water could be delivered to drought-hit parts of the country. Kenya, in lack of water would like to modify the agreements, as they want to utilize the water of Lake Victoria for irrigation and - in case of serious droughts – for supplying drinking water to Nairobi. Rwanda and Burundi are preparing to construct dams on a river having the biggest water discharge from those which flow into Lake Victoria with the view of agricultural irrigation and storing drinking water reserves. Uganda needs hydropower works to comply with her energy problems, and also plans to construct water reservoirs to meet demands for drinking water and irrigation. The number of inhabitants in Uganda might reach 85 million for 2050 (Bartalos A). It can be said that in cases of all the countries diversion or retaining of water discharge would generate various and serious risks. Agricultural, physiologic, environmental, etc. impacts and inter-relationships are still not known well. Therefore international co-operation is needed and a thorough and both preliminary and retrospective survey and analysis would be necessary even in the form of an agricultural information and extension system based on jointly set principles and objectives. All this could establish the rational and sustainable (farming and water) management and could serve the wealth and security of the inhabitants of the region (Kozári J 2009).

Hydraulic Energy of the Nile

In the Nile valley several dams respectively hydropower stations had been constructed. From about those the best known one is the previously mentioned Aswan Dam in Egypt. The hydropower plant constructed on the impounding dam (Great Dam) which was put into operation on 21st July 1970 reached its total capacity six years later: since that time its Soviet-made turbines generate 10 Billion kilowatts of energy. Their operation in the first decades was of a key importance from the aspect of a supply of the African country. (Tarján M T). However, nowadays – due to the increased consumption of households and the industry, - it can cover only a small part of the demands in Egypt. In Sudan, construction of new dams at cataracts No. 3 and 4 are in process.

Ethiopia plans to double the electric power generation capacity of her hydro-power plants. Led by this intention a new dam will be constructed on Tekeze river and the first stage of the project Grand Renaissance Dam (former name Grand Millennium Dam) would be completed on Blue Nile as well. This giga-project can be expected to be fully completed by 2035 when – being the largest hydropower plant of Africa – will be able to generate 6000 MW of energy during peak hours. Uganda plans to build a new dam close to Lake Victoria. According to experts' opinion dams built exclusively for power generation do not mean significant constraints in forwarding water to the downstream riparian states (Shinn D H 2006), while others say that it is not fully true as the continuous operation of hydropower-stations smaller or bigger dammed reservoirs are needed.

The water reservoir which is to be created for the Grand Renaissance Dam would evaporate on a much larger surface than the narrow Blue Nile river crossing through Ethiopia at present. Therefore after the completion of the dam, in all probabilities, the quantity of water reaching Egypt can be expected to decrease (Visnovitz P 2013).

Conflict Prevention, Diminishing Tensions

The competition for water – as a more and more limited available resource – has brought serious tensions into the relations of the countries of the Nile valley. No need to emphasize that it is a very important question should it be viewed either from the point of drinking water supply, food security and –supply or from the energy security. It is considered an important issue of national security in each of these countries. Egypt, in the past had threatened Ethiopia with armed intervention if Addis Ababa attempted to hinder the flow of the water of the Nile. After having concluded the Peace Treaty with Israel in 1979 President Anwar Sadat claimed that Egypt might launch war only for one reason, namely if there was a threat of the country's water supply. It was reflected in the President's speech as well in 1980, when he pointed out that if Ethiopia implemented her plans of river-regulation, Cairo would need to act by force against Addis Ababa, but would not hesitate to react in a similar way against Khartoum as well (Glied V 2008). During the 1970's and 80's there were several occasions when only the good luck and common sense emerging in the last minute prevented the bursting out of a war which most likely would escalate to a regional conflict.

The region of the Nile respectively its direct environment is charged by numerous conflicts of other character: Darfur-crisis, the Ethiopian-Eritrean relation, the internal situation of Somalia or Congo, however in a wider sense the Egyptian-Israeli relation (which became cooler since the Revolution of 25 January 2011) the Palestinian issue the risks of forging ahead of the radical Islam and also the endeavours of great powers to get in possession of the oil and natural gas reserves of certain countries of this region can be mentioned. In order to maintain the fragile status quo principally Egypt and Ethiopia need to find a way of reconciliation. Both countries have high responsibility to preserve and strengthen the stability of the region itself and also far beyond its geographical radius. Egypt for instance strives for the stability of the Middle East as well, mediates in the Palestinian – Israeli reconciliation, and also supports the idea of the creation of a Nuclear-Weapon-Free Zone (NWFZ) in the Middle East (Gyene P, Harangozó D 2011)

The stakeholder countries (the riparian states), as a result of considerable international mediation and pressure, after all recognized that long-lasting solution for this complex issue can be reached only by reducing or eliminating the conflicts instead of heating them further. The first and most important steps have already been taken by them in the right direction.

Co-operation at inter-governmental level started in the recent decade in order to solve the problems around Nile River. In 1992 with the participation of six countries (Zaire /now R. D. Congo/, Egypt, Rwanda, Sudan, Tanzania and Uganda) the Ministerial Council in charge of Water Issues (Nile-COM) was established, in the work of which governmental delegations of further four countries participated as observers. One year later Nile-COM established the organization TECCONILE (Technical Co-operation Committee for the promotion of the Development and Environmental protection of the Nile Basin) which was specialized in supporting the innovations of activities related to water exploitation and utilization and also in the protection of the environment of the river. During this period the first session of conference series Nile 2002 was held in co-operation with the Canadian International Development Agency (CIDA). In 1995 in the organization of TECCONILE the Nile Basin Action Plan was launched in which from the beginning all the – that time – ten riparian countries were represented. They endeavoured to find a solution together for the arising problems. In 1997 the World Bank the United Nations Development Programme

(UNDP) and the CIDA together with TECCONILE and the Nile-COM jointly established a programme which aimed to facilitate dialogues and co-operation of the Nile riparian countries. After all this in 1998 the concerned governments initiated discussions in the hope of fostering regional co-operation and more conscious utilization of the Nile river. Eritrea was the only country which was not represented at the talks. As a result of the negotiations – in May 1999 – the Nile Basin Initiative (NBI) was officially established the head office of which is located in Entebbe city in Uganda (Végh D 2008). The riparian countries – with the exception of Eritrea (being in observer status) – became full-fledge members of NBI which aims to establish regional partnership and co-operation. Being supported and coordinated by the World Bank the International Consortium for Co-operation on the Nile (ICCON) was established which grants financial contributions to joint projects of water utilization. The closing up of underdeveloped regions need a centrally-coordinated approach and the planned developments are to be based on arrangements which show beyond regional and sector-oriented contemplation (Tóth T, Goda P, Malomsoki M 2009).

Oil exporters, or those states which are striving for establishing their economies on oil exports (like the two Sudanese states) should be aware and would even soon face two very timely problems which reflect to the fact that on longer run economic development cannot be based on just rising oil prices. On one hand it is the state of food production respectively the case of wheat and other cereals where the level of self sufficiency shows decreasing trends, and on the other hand, the fact that growth rate of population exceeds the growth rate of food production. (Zsarnóczai J S 1997). These difficulties are typical in case of the majority of states in the Middle-East and in Sub-Sahara. A very important result that it is getting to be recognized by the riparian countries is the fact that utilization of the River Nile is not a so called zero sum game. There are and will be still enough reserves to be exploited and utilized jointly. Therefore instead of a win – lose situation, it can be converted to a win – win model. Relying on this point of view further programs have already been launched such ones which might be advantageous for the riparian states in the fields of water quality improvement, growing plant cultures of lesser water demand, wastewater utilization and the improvement of environmental conditions of catchment area.

In spite of the fact that shortage of foodstuffs can be explained by significant natural reasons it will be necessary to set up a flexible agricultural policy which would create harmony between the abilities of the concerned countries and the global and regional economic environment in both economic and social sense. Such agricultural policy should principally aim and serve the public wealth, respectively that the population – at the given growth rates – should have access to the necessary foodstuffs. All this should be done rather by the better utilization of internal resources than just by increasing the imports (Zsarnóczai J S 1992).

Countries with considerable potential of hydraulic energy may export electric power to Sudan and Egypt or other countries. There are methods under development how to diminish the evaporation loss of Lake Nasser which is estimated to be around 12%. The artificial lake, being located at the border of Egypt and Sudan stores about 150 Billion m³ water. Therefore a huge amount of water could be saved if the rate of evaporation was reduced. Egyptian experts – already in 2007 – elaborated two different methods for it. The material the fluctuating one set in a frame or the pontoon-solution respectively the application of circular elements made of foam-sponge. Depending on factors of durability and costs the covering layer could be made of various materials like oilcloth, polystyrene, perlite, rubber, plastic, etc. Both methods are based on the decrease of the evaporating surface and on the partial covering of water table. During the development the experts' main findings were as follows:

- The daily evaporation losses of Lake Nasser in a yearly average were 6.3 mm.
- The annual average evaporation losses were 12.5 Billion m³. Losses of water of one million m³ could be prevented by circular foam-sponge plates of at least 90% coverage.
- The circular foam-sponge system had the advantage that it can be regulated thus it did not hinder the solar radiation to the aquatic biosphere.
- This technology did not hinder the navigation.
- By the application of plates in different sizes the extent of evaporation could be regulated (Reda MA Hassan et al. 2007).

According to experts if the amount of water used by Egypt and Sudan was stored in Ethiopia it could be more efficient and economic way as on the Ethiopian highlands the evaporation loss is around 3% only (Shinn D H 2006). All these steps and international efforts could be suitable to prevent or moderate potential conflicts in the Nile Basin. The present, more or less existing status quo is really fragile. It is still typical that politicians of Cairo and Addis Ababa keep on using tough rhetoric to each other if the issue of the discharge of the Nile comes up, however Cairo would hardly risk a military conflict and its consequences. It cannot be seen clearly yet that South Sudan – which gained its independence in 2011 in a relative peaceful way – would follow openly or informally the direction of Cairo (which is backed by Khartoum as well) and joins the agreement of 1959 or would choose another way.

It should also be considered that there are positive international examples even in such countries which do not possess with natural surface water reserves. For instance in the Sultanate of Oman a complex water utilization strategy was elaborated and implemented, in the frames of which sewage treatment, purification and recycling and also desalination of seawater can provide additional quantities to the natural water reserves (Nadicsán J 2014).

Conclusion: Lessons with European Eyes

The strategic importance of water is getting continuously institutionalized in the economic and security policy doctrines and the governments would elaborate concepts in accordance with this at national and international levels. To face challenges exposed by water like wise and foreseeing management of the possibilities the water means for us needs international co-operation and the consideration of this issue in global and regional context therefore the most adequate allies and partners needed to be found (Tóth J I 2012).

Although at the moment Hungary and the Danube riparian countries do not need to face such grave difficulties of Nile riparians, they have to be fully aware that water resources are limited. In all probability the impacts of climatic changes will be more severe therefore considerable competition for water may emerge in the future in Europe as well. Therefore thorough attention should be paid to the Nile riparians, their example can serve as a lesson for Europeans.

Naturally it would not be easy rather it would be exaggerated to apply the analogy of the situation having been formed along the Nile for the present Europe or only to the valley of the Danube even in theory. Floods during the recent years, even in 2013 happened in Europe, therefore one may think that water is abundant, no risk for chronicle lack of water. But it could also be felt that the periods abundant in precipitation and thus in water discharge do not coincide with those weeks/months when agriculture would need it most.

Hungary – due to her situation – can be considered as a typical downstream country as 95 % of water outflows are arriving from other countries. However water inflows are coming from three different main directions. Therefore the risk of a severe and sudden shortage of freshwater is definitely not really high - *contrary to the case of downstream riparians of the Nile [remarked by the Author]* - however in certain localities temporary

shortages can occur. The potential risk for the latter was one of the reason why dispute between Hungary and Slovakia came about on the implementation of Gabčíkovo (Bős) – Nagymaros Dam and Hydropower station project. (Szalkay Cs 2004). Luckily the conflict did not lead to violence. The European Community (EC) intervened initially and later the parties agreed to submit the case to the International Court of Justice in The Hague (ICJ). The ICJ passed its judgment in September 1997. Although the Slovak Side requested an additional ruling in 1998, after the first decision in 1997, the conflict had lost so much of its intensity that it was commonly perceived as having been settled (Fürst H 2003).



Figure 2. The Danube River basin

Source: www.ce.utexas.edu/prof/mckinney/ce397/Topics/Danube/Danube.htm

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The co-operation of the Danube riparian countries is bound – luckily – with more strict and stable international agreements than those of along the Nile. The Danube and its catchment area today in decisive extent belong to the territory of member states of the European Union. Hungary in accordance with the Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy) prepared her plan of catchment area management plan (VGT) and participated in the strategy – concerning 19 countries – for the entire catchment area of the Danube river (Ruzsin-Tilesch J, G. Tóth L 2013).

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