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WATER RESOURCES OF THE REPUBLIC OF ARMENIA AND THE EXPORTING OPPORTUNITIES OF POTABLE WATER

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In addition to production factors which contribute to the socio-economic development, it is also important to include natural resources (including water) in economic turnover and to create conditions connected with it which will contribute to the efficient use and management of natural resources. Another important issue is the utilization of water resources in Armenia based on the economic interests of the country.

The country's main path is to increase the production factors both in economic progress and in improving the living standards of the population that depends on the increasing of export volumes and the comparative advantages of such country like Armenia which has an open and small economy.

The research done by the authors shows that comparative advantages of Armenia are drinking water resources that are increasingly appreciated on the global market day by day. This circumstance creates new opportunities for Armenia in terms of exporting drinking water to the world market and increasing export incomes.

Key words: *national wealth, water resources, intake, water utilization, loss of water resources, drinking water, bottled water, export, comparative advantage.*

Introduction

Among the factors which the social and economic development of any country is conditioned by, such as employment, capital and entrepreneurial experience and skills, singnificant importance is given to both natural resources and conditions and their processes of being included in economic turnover and the effective management and organization of these processes.

Moreover, it is possible to achieve the improvement of such important indicators which characterise the level of development of the country as national wealth is, which is one of the main macroeconomic indicators and in fact characterizes the level of capitalization of the country. It is currently characterized by four components: produced, natural, human capitalized and the value of net foreign assets. It is noteworthy that the national wealth of the population per capita estimated by the experts of World Bank comprised 52,884 mln dollars, including the produced capital of 15,451, natural capital 12,702, human capital 27,329 and net foreign assets 2588 mln dollars [1:226-233]. The country's main path is to increase production factors both in the economic progress and improving the living standards of the population, especially in such countries with open and small economies as the Republic of Armenia is, depending on the increase in the export amount and the disclosure and use of comparative advantages of the country. Among the natural resources of the Republic is the drinking water which has its unique place and by means of its large-scale export it is possible to significantly increase the monetary income of the country and thus improve the balance of payments.

Conflict settings

The negative value of trade assets was typical for all the years of the third Republic of Armenia. Thus, the RA export comprised 270.9 mln US dollars in 1995, the import comprised 673.9 mln US dollars, the negative balance of foreign trade comprised 403.0 mln US dollars. Those indicators correspondently comprised the export - 300.5 mln US dollars in 2000, the

import - 884.7 mln US dollars and the negative balance - 584.2 mln US dollars. In 2005 they comprised correspondently 973.9, 1801.7 and 827.8, in 2010 – 1041.1, 3748.9 and -2707.8 mln US dollars, in 2015 - 1485.3, 3239.2 and 1753.9 mln US dollars, in 2016 - 1791.7, 3273.5 and 1481.8 mln US dollars, and in 2017 the export comprised 2242.9 mln US dollars, the import - 4182.7 mln US dollars and the negative balance -1939.8 mln US dollars [2].

The negative balance of foreign trade has led to the negative balance of payments of the country, which has resulted in an increase in the country's external state debt (about $ 7 billion), the further increase of which is related to the emergence of serious socio-economic and political problems. In this regard, it should be noted that according to the 2019 state budget project, a considerable amount of state budget expenditures of RA will be spent on foreign state debt service in the coming years.

Based on the above mentioned, the revelation and use of increasing sources of income of the Republic are currently signified, among which, in our opinion, the water resources are of great importance. And if we notice that the considerable part of these reserves are not used in the territory of the republic and they flow to neighboring countries, it will become clear that one of the world's most expensive natural resources which is the water is "exported" from the republic at zero cost. If the consuming value of certain product lies mainly (not exceptionally) in the basis of exchange value of any product, the water is that unique irreplaceable product (unlike oil which can be replaced by many other alternative means). So the former UN Secretary-in–Chief Ban Ki-Moon's words are not accidental while answering the question what the reason for the Third World War would be: "I think it will be because of the liquid, but it will not be oil." Obviously, this concerns the drinking water.

Research results

The brief description of the water supplies of the Republic of Armenia

The water supplies of Armenia are mainly formed as a result of atmospheric precipitations falling on its territory and the part of watercourses of the boundary rivers of the Araqs and the Akhuryan. Though the most part of the researchers has unanimous opinion about the source of emerging water suppies, during the estimation of the capacities of those resources very different values are presented [3, 4:45, 5:27, 34, 6, 7, 8:84, 278, 9, 10:63-67, 11]: Even for such dimension that is surface current long time dimension, which is considerably constant dimension (it is determined on the average data of 75-80 years), the conclusions are very different. Basic differences are noticed among the indicators of underground water characteristics, particularly, in terms of the supply capacities of usage «exploitation»[1]. So, the water supplies (surface and underground) are estimated from 11,7^3 km till 9,0 and even 7 km^3 [12:59].

In 1961-1990 the average annual amount of precipations in RA comprised 592 mm and in 2017 481.0 mm (the deviation of precipitation of 2017 comprised -111 mm in 1961-1990) [13:118].

More than 80% of the total river runoff is formed in the territory of the republic (excluding the basin of Lake Sevan). The remaining part of surface current comprises the transit flow of boundary rivers of the Araqs and the Akhuryan [14:5]. The inflow of boundary rivers is estimated equally at 0.9 billion cubic meters per year. The difference between the underground inflow and outflow is positive, about 0.1 billion cubic meters per year. The annual evaporation comprises 11.5 billion cubic meters, and the moving lower flow comprises 6.3 billion cubic meters. The renewing water supplies of surface waters comprise 7.2 billion cubic meters per year. About 2.3 billion cubic meters of these waters are in use now (in the past 4 billion cubic meters), 2 billion cubic meters of which (up to 3 billion cubic meters in the past) is used for irrigation and support for other spheres and 430.0 million cubic meters

[1] Though the expression of the exploitation of water resources has deep meaning in theory and in practice as well, in our opinion this word has been politicized, it has been given the meaning of «class» and it is time for it be replaced by accepted and applicable word «use» in Armenian.

(in the past 550 million cubic meters) is used for drinking and household application [15:5-6].

The most significant of natural water bodies is Lake Sevan with 1278.74 sq.km total surface and 38.21 cubic km capacity, level index is 1900.52 meters [16:9]. According to Table 1, the level of Lake Sevan has risen by 32 centimeters in 2013-2017. It should also be noted that in recent years both technical and economic studies on water resources have been increased according to their significance and importance [17].

Table 1

The passes from Lake Sevan by years and its level fluctuations by months in 2013-2017

	Water passes mln cubic meters	Lake level and monthly fluctuations													
		Water level index meters	Monthly fluctuations comparing with the previous month, sm											Water level index in the end of the year, m	Water level fluctuations comparing with the beginning of the year, sm
			January	February	March	April	May	June	July	August o	September	October	November	December		
2013	169.95	1 900.10	-1	+4	+5	+12	+20	+9	-6	-15	-8	-8	-3	-3	1 900.16	+6
2014	269.63	1 900.16	-	+4	+4	+11	+15	-	-5	-16	-6	-7	-2	-1	1 900.13	-3
2015	167.74	1 900.13	-1	+1	+4	+16	+19	+4	-10	-12	-8	-1	-2	-4	1 900.19	+6
2016	167.13	1 900.19	+3	+6	+5	+12	+22	+10	-5	-8	-8	-5	-2	-3	1 900.46	+27
2017	266.76	1 900.46	-1	+2	+5	+17	+19	-	-10	-13	-12	-5	-3	-3	1900.42	-4

ource from «The Social-economic condition of Armenia in January 2018», Yerevan, RA National statistical committee, 2018, p. 120

The current condition of water supply utilization of the Republic of Armenia

Table 2 presents the intake and utilization of sweet water in the Republic of Armenia in 2011-2017 according to the classification of economic activities, which shows that an increase of intake has increased by 17.5% in comparison with the data in 2011 (from 2438.3 million cubic meters in 2011 to 2865.4 million cubic meters in 2017). In the same period, the largest amount of water intake was registered in 2015 as 3271.7 million cubic meters. The same indicators for water utilization was 17.4%, 2533.1 million cubic meters respectively. According to the classification of economic activity, the largest water intake implementer was the water supply, sewerage, waste management and recycling sector, whose share in total intake decreased from 65.8% in 2011 to 61.0% in 2017, and the water utilization indicators of this type of activity comprised 9.5% and 6.5% respectively. Agriculture, forestry and fishing sector occupy the first place in terms of water utilization, the share of which reached 85.9% in 2017 from 78.7% in 2011. Thus, in agriculture, forestry and fishing water intake if the irrigation section comprised 5.2% in 2011, then 20.5% was in fishing /fish industry/, or, in other words, the share of the latter was four times higher. In the same year the shares of water utilization were 49.9%, 28.7% and 57.5% respectively. In 2017, the water intake of agriculture, forestry and fishing industry increased by 33.6%, water use - 85.9%, irrigation rates - 15.6% and 60.6% respectively and fisheries (fish breeding) 18.0% and 25.2% respectively.

The dimension of water utilization index depends on technological, anthropogenic and other factors of certain types of economic activity as well. Table 3 shows the utilization of water by the RA GDP for 1,000 drams in 2013-2016, according to the main types of economic activities utilizing water. According to the data, the water utilization rates for 1000 drams of GDP in Armenia in 2013-2016 are significantly different from each other. Thus, if the highest indicator for water supply, sewerage, waste management and processing in the sector was registered in 2014 (10.5), then in some types of activities (process efficiency, construction) this index was close to 0.0. In general, the water consumption of the RA GDP for 1000 drams was 0.46 cubic meters in 2013 and it increased slightly in 2016 (making 0.49) and the average for these years was 0.47 degrees cubic meters.

Table 2

Water intake and utilization of sweet waters in the RA in 2011-207 according to the classification of the types of economic activities

	2011		2012		2013		2014		2015		2016		2017	
	Intake	**Utilization**	**Intake**	**Utilization**	**Intake**	**Utilization**	**Intake**	**Utilization**	**Intakle**	**Utilization**	**Intake**	**Utilization**	**Intake**	**Utilization**
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Total RA	**2438.3**	**1738.1**	**2941.2**	**2187.2**	**2955.1**	**2089.1**	**2860.5**	**2112.8**	**3271.7**	**2533.1**	**3181.9**	**2470.0**	**2865.4**	**2040.0**
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture, forestry and fishing	627.5	1367.7	790.9	1793.2	1362.8	1845.9	921.3	1748.1	1097.7	2269.9	896.6	2191.6	961.4	1751.6
	25.7	78.7	26.9	82.0	46.1	88.4	32.2	82.7	33.6	89.6	28.2	88.7	33.6	85.9
Irrigation	127.5	867.7	178.7	1181.1	561.1	1044.5	224.9	1051.7	357.6	1519.1	227.3	1522.3	446.3	1236.6
	5.2	49.9	6.1	54.0	19.0	50.0	7.9	49.8	10.9	60.0	7.1	61.6	15.6	60.6
Forestry	0.3	0.2	0.4	0.4	0.6	0.5	0.5	0.5	0.0	0.7	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fishing / Fish industry	499.7	499.7	611.8	611.7	801.1	800.9	695.9	695.9	740.1	750.1	669.3	669.3	515.1	515.0
	20.5	28.7	20.8	28.0	27.1	38.3	24.3	32.9	22.6	29.6	21.0	27.1	18.0	25.2
Mining industry and open mine exploitation	54.9	54.9	152.3	152.2	58.4	58.3	101.9	133.8	44.0	88.1	81.6	81.5	83.9	83.9
	2.3	3.2	5.2	7.0	2.0	2.8	3.6	6.3	1.3	3.5	2.6	3.3	2.9	4.1
Processing industry	93.6	9.4	45.9	4.5	41.7	4.1	38.0	4.2	41.1	4.2	5.9	6.0	7.7	7.7
	3.8	0.5	1.6	0.2	1.4	0.2	1.3	0.2	1.3	0.2	0.2	0.2	0.3	0.4
Electricity, gas, vapour and good quality air support	40.9	38.3	33.5	32.1	23.1	22.2	27.9	27.8	24.2	24.2	21.6	21.4	27.2	27.2
	1.7	2.2	1.1	1.5	0.8	1.1	1.0	1.3	0.7	1.0	0.7	0.9	0.9	1.3

Continuing Table 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Water supply, sewage , waste managemet and processing	1603.2	165.4	1902.3	147.6	1456.8	113.1	1744.2	147.8	2060.7	119.1	2166.0	123.2	1747.7	132.1
	65.8	9.5	64.7	6.7	49.3	5.4	61.0	7.0	63.0	4.7	68.1	5.0	61.0	6.5
Water supply (water drainage, processing and distribution)	1602.0	164.3	1902.2	147.4	1444.9	111.2	1743.8	147.5	2050.7	97.2	2165.7	122.7	1744.4	128.8
	65.7	9.5	64.7	6.7	48.9	5.3	61.0	7.0	62.7	3.8	68.1	5.0	60.9	6.3
Engineering	0.7	0.7	0.5	0.5	0.2	0.2	4.7	4.7	0.1	0.1	0.1	0.1	3.6	3.6
	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.2
Other types of economic activity	17.4	101.7	15.8	57.1	12.2	45.3	22.5	46.4	3.2	27.5	10.1	46.5	33.9	33.9
	0.7	5.9	0.5	2.6	0.4	2.2	0.8	2.2	0.1	1.1	0.3	1.9	1.2	1.7
GDP, mln USD (2011 purchase equivalent)	-	**20192.6**	-	**21646.5**	-	**22360.8**	-	**23165.8**	-	**23907.1**	-	**23954.9**	-	**25751.6**
Water utilization of GDP of 1000 dollars (2011 purchase equivalent), cubic meter / 1000 USD	-	**86.1**	-	**101.0**	-	**93.4**	-	**91.2**	-	**106.0**	-	**103.1**	-	**79.2**

Numerator is mln cubic meter, denominator by % to the total
Source formed and calculated on the basis of the data given by RA statistical committee bases of the department of «Water resources»
Referemce http://armstatbank.am/pxweb/hy/ArmStatBank/?rxid=002cc9e9-1bc8-4ae6-aaa3-40c0e377450a

Table 3

Water utilization of the RA GDP for 1000 drams in 2013-2016 according to the main economic activities which utilize water

	GDP, mln AMD				Water utilization, mln cubic meter				Water utilization of GDP for 1000 drams (with current prices), cubic meter /1000 AMD				
	2013	**2014**	**2015**	**2016**	**2013**	**2014**	**2015**	**2016**	**2013**	**2014**	**2015**	**2016**	**Average 2013-2016**
Agriculture, forestry and fishing	839,821.1	872,631.1	868,671.0	809,723.4	1845.9	1748.1	2269.9	2191.6	2.20	2.00	2.61	2.71	2.38
Mining industry and open mine exploitation	102,686.8	102,553.2	107,717.5	132,416.1	58.3	133.8	88.1	81.5	0.57	1.30	0.82	0.62	0.83
Processing industry	441,103.1	466,754.6	464,325.5	466,608.4	4.1	4.2	4.2	6.0	0.01	0.01	0.01	0.01	0.01
Electricity, gas, vapor and good quality air supply	183,232.0	188,032.3	231,279.0	228,425.7	22.2	27.8	24.2	21.4	0.12	0.15	0.10	0.09	0.12
Water supply, sewage, waste management and processing	13,181.7	14,106.9	19,223.5	22,481.0	113.1	147.8	119.1	123.2	8.58	10.48	6.20	5.48	7.68
Engineering	476,564.0	448,772.6	474,107.0	406,201.3	0.2	4.7	0.1	0.1	0.00	0.01	0.00	0.00	0.00
Other types of economic activities	2,499,049.5	2,735,775.6	2,878,309.7	3,014,008.7	45.3	46.4	27.5	46.2	0.02	0.02	0.01	0.02	0.01
Total (gross domestic production or water utilization)	**4,555,638.2**	**4,828,626.3**	**5,043,633.2**	**5,079,864.6**	**2089.1**	**2112.8**	**2533.1**	**2470.0**	**0.46**	**0.44**	**0.50**	**0.49**	**0.47**

Source formed and calculated on the basis of the data given by RA statistical committee bases of the department of «Water resources»
Referemce http://armstatbank.am/pxweb/hy/ArmStatBank/?rxid=002cc9e9-1bc8-4ae6-aaa3-40c0e377450a

Water resource losses

The study of statistical data shows that water resources losses are still high in the Republic of Armenia (Table 4). It should be noted that the losses of water resources in 2011-2017 have not been reduced, but they were increased reaching from 700.1 million cubic meters in 2011 to 825.4 million cubic meters in 2017. In other words, if the loss of water resources was only 28.7% of water intake (2438.3 million cubic meters) in 2011, in 2017 it comprised 28.8%. At the same time, the biggest loss of water resources was observed in water supply, sewerage, waste management and recycling, the share of loss in total losses was 99.6% in 2011, then in 2017 it reached 100%. If we estimate the water resource utility coefficient (the ratio of water utilization and water intake) in Armenia, we find it proper to consider it at two levels. a) the final water use indicator in water intake; and (b) the final water use indicator within the water resources (we accept at 10 cubic km per year or 10 billion cubic meters per year) in the territory of the RA. In this case we will have the following picture: in 2011 the water resource utility coefficient was: a) 71.3% for the case, the loss of water resources comprised 1738.1 mln cubic meter, b) 17.4% for the case, and the loss of water resources - 8261.9 million cubic meters, respectively in 2017: a) for the case - 71.2%, water use - 2040.0 million cubic meters, and b) 20.4% for the case, and the loss of water resources - 7960.0 million cubic meters. In other words, for every 4.8 years (38.21 cubic km / 7.96 cubic km), the Republic of Armenia "loses" one Lake Sevan. Thus, it turns out that the most expensive resource "exported" from the Republic of Armenia, the fresh drinking water, is "exported" to the neighboring country at zero cost. It follows that radical reforms are needed in the republic to improve the water utilization and to increase the efficiency of water resources utilization.

Table 4

Water losses according to the types of economic activities in 2011-2017 mln cubic meter

	2011	2012	2013	2014	2015	2016	2017
Total Ra	**700.1**	**754.0**	**866.0**	**747.4**	**738.6**	**711.9**	**825.4**
Agriculture, forestry and fishing	0.1	0.1	0.2	0.2	0.0	0.0	0.0
Irrigation	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Forestry	0.1	0.0	0.1	0.1	0.0	0.0	0.0
Fishing/fish industry	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Mining imdustry and open mine exploitation	0.0	0.1	0.1	0.1	0.0	0.1	0.0
Processing industry	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electricity, gas, vapour and good quality air supply	2.5	1.4	0.9	0.0	0.0	0.2	0.0
Water supply, sewage, waste management and processing	697.5	752.4	864.8	747.1	738.6	711.7	825.4
Water supply (water drainage, processing and distribution)	697.5	752.4	854.8	747.1	738.5	711.7	825.4
Engineering	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other types of economy activities	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source formed and calculated on the basis of the data given by RA statistical committee bases of the department of «Water resources»
Referemce http://armstatbank.am/pxweb/hy/ArmStatBank/?rxid=002cc9e9-1bc8-4ae6-aaa3-40c0e377450a

Here we should also point out that the potable waters of Armenia are noted by high quality, and one part of them, being «formed» in earth entrails, contains the necessary mineral waters for humans (see table 5).

Table 5

Water intake of sweet waters (surface and underground), by indexes and by years mln cubic meetr

	1990	2000	2005	2010	2015	2016	2017
1. Water intake (total 2+3),mln cubic meter	3942.0	1871.2	2770.6	2126.4	3271.7	3181.9	2865.4
2. Water intake from surface springs, mln cubic meter	2616.6	1338.2	1967.6	1250.6	1967.3	2045.6	1710.9
3. Water intake from underground springs, mln cubic meter	1325.4	533.0	803.0	875.8	1304.4	1136.3	1154.5
4. Regenerating water resources, mln cubic meter, year	6810.0	2873.0	8457.0	8681.0	6441.0	6882.0	-
5. The co-number of water resource exploitation (CWRE), %	57.9	65.1	32.8	24.5	50.8	46.2	-

Source formed and calculated on the basis of the data given by RA statistical committee bases of the department of «Water resources»
Referemce http://armstatbank.am/pxweb/hy/ArmStatBank/?rxid=002cc9e9-1bc8-4ae6-aaa3-40c0e377450a

Table 6

The indexes of exporting and importing of natural or mineral waters and drinks in 2005-2017

Products	Year	Export (tonne)	Export (1000 USD)	Import (tonne)	Impoprt (1000 USD)
1. Waters, natural or artificial mineral water and drink (sugar free)	2017	16905.3	7333.3	1022.4	652.5
	2016	15039.8	6055.7	345.9	186.7
	2015	14702.6	5997.6	543.2	184.3
	2010	12771.1	5341.1	288.5	197.5
	2005	6342.2	1661.6	50.3	30.6
2. Mineral water and drink (with sugar)	2017	4353.4	2980.0	18191.1	11555.1
	2016	5638.4	3661.9	70162.9	9305.3
	2015	3844.9	2848.3	14832.8	9105.6
	2010	2006.1	2025.9	20494.9	14639.4
	2005	1384.3	805.8	7526.5	3964.5
Total	2017	21258.7	10313.3	19213.5	12207.6
	2016	20678.2	9717.7	70508.8	9492.0
	2015	18547.6	8845.9	15375.9	9289.8
	2010	14777.2	7367.0	20783.4	14836.9
	2005	7726.5	2467.4	7576.9	3995.1

Information source formed and calculated according to the data of «Foreigh trade data base according to goods list 4 numbered classification» of RA Committee of statistics
Reference https://www.armstat.am/am/?nid=148

The indexes of exporting and importing natural or artificial mineral waters or drinks

It follows from the data of Table 6 that the amounts of exporting and importing of natural and artificial mineral waters and drinks are poor dimensions which do not correspond to RA water resource potential and opportunities. Urgent necessity emerges to increase abruptly the export sizes of above mentioned goods.

Potable water as an international trade item

The study of the world market of separate products and services shows that in the last 20-30 years deep and overall changes have taken place in that area. Depending on the demand, new products have emerged, and on the contrary, part of them gradually "leave" the market due to the lack of demand.

One of the most important products of the world market in recent years is potable water which gradually increases the amount and segmentation of product circulation of export and import of different countries. We can also surely say that the capacities of drinking water will increase significantly in the near future. It is obvious that the satisfaction of the needs of potable water of the population is very problematic in some countries and these countries are looking for a variety of ways to solve this problem. For example, in the 1970s, the icebergs of the Northern Pole were mentioned in the ways of gauging the demands of Arabic countries of poptable water which were pulled to the Arab Peninsula and were bottled for the population. On the other hand, those countries that are rich in potable water resources can benefit from the situation in the global market and receive foreign exchange inflows from them which is necessary to reduce the negative foreign trade balance of the republic.

From the point of view of expanding the export opportunities of drinking water from the RA, it is important to present the developments in its global marketplace and along with it to discuss the dynamics of bottled water consumption. Along with global urbanization and ecological pollution, the issue of drinking water is becoming more and more urgent all over the world as a result of which the bottled water becomes a demanded product and its production a profitable and promising branch of business respectively. Drinking water is one of the rare resources that our country is rich with. The production of drinking water, particularly that of bottled water, starts to acquire new scales and qualities in our country. Recently, this sector of the market has been aggravated by competition, new competitors are emerging, which leads to the increase of fitted market level. Nevertheless, we still have an unsettled problem of presenting bottled water in the global market which is especially important in the context of rapid change of situation in the global market. In recent years, the consumption of bottled water has risen by more than 2.4 times in the world from 90 billion liters (1999) to 215 billion liters (2009), and the market volume in terms of money has grown at a much higher rate than in the same period from $ 22 billion 80 billion dollars, that is, more than 3.6 times. This means that there is a significant price rate increase of drinking water. Accordingly, if in 1999 one liter of bottled water cost $ 0.25 in average, then 10 years later it was $ 0.37. By the way, AMD/USD average exchange rate was AMD 135 or USD 0.34 in 2009. In Armenia, the cost of one liter varies between 80 to 240 drams for various containers and for different brands, and the containers of 0.5 liter water are mostly consumed with a value of 100-150 drams (one liter of 200-300 drams or current US dollar (483 AMD/1 USD) 0.41-0.62 USD). It means the price of bottled water in the international markets is almost 1.5-2 times cheaper than the existing prices in the Armenian market. This means that water is sold more expensively in Armenia, a so called “country of waters” from the "international price criteria". Thus, one person in the world consumes 32 liters of bottled water annually in average thus spending money equivalent to $ 12. In some countries, more than 230 liters of bottled water is shared per capita. Experts estimate that in the coming years the demand for bottled water will continue to grow, as the drinking water problem is exacerbated all over the world and governments are simply unable to overcome these problems.

According to Beverage Marketing Corporation, the largest bottled water market in the world is the United States with a share of about 16%. Generally, North America accounts for 30.3% of global sales. The second largest part is Europe with a share of 28.9%, with 27.1% share in Asia and only 13.7% in the remained parts of the world. Although the developed countries have traditionally been the dictators in the

bottled water market, however, the developing countries have begun to say their word over the last decade. Only in 2005-2008 China's demand for this product increased more than twice, the demand of Indonesia grew 1.6 times and thaty of Mexico 1.5 times over the same period. By the way, the latter is considered to be the world's leader by bottled water consumption in the world, and according to statistical data, the index was more than 230 liters in this country in 2009. Among the leading countries with this rate of the world are the countries of Western Europe - Italy, Belgium, Germany, France and Spain. Bottled water is also consumed much in the Middle East, UAE, Lebanon, Qatar, Saudi Arabia and so on.

Generally speaking, four of the world's six leading countries are the developing countries in the world market share. The surprising fact is Mexico's being in the second place and China's being as "serious ambitious".

And despite the fact that the world's bottled water market changes its geography very quickly, depriving European countries of the "main markets" label, however, 13 of 20 countries which consume the most bottled water per capita in the world are still located here.

The growing interest towards bottled water in the world is shown by the sizes of consumption of bottled water as compared to other drinks. Particularly, according to statistics, in the last decade the consumption of this product was in the second place among the drinks in the largest bottled water market, which is the US, while only ten years ago it was the fifth. Over the years, bottled water has risen over beer, coffee and milk, and now it gives way to only carbonated soft drinks. So, in the US 57 billion liters of carbonated soft drink were consumed in 2000 which made up 28% of all the drinks, and this is in the case when it was only 9% or 18 billion liters. By 2008, consumption of carbonated soft drinks reduced to 53 billion liters, and the consumption of bottled water reached 33 billion liters (about 15 percent of total consumption of beverages). The world's bottled water markets have clearly shaped giants such as Nestle, Danone, Coca-Cola and Pepsi Cola. The latters share over 35% of global turnover together. The leader is Nestle, 12%, the second is Danone with 8.5%. According to expert estimations over the next five years, these multiprofile companies being specialized in food technologies will focus their attention on the issues of water production, which, in its turn, will contribute to the increase of the role and market concentration of these companies in the global market. Totally eight out of ten world's leading brands with their realization capacities are owned by the "Big Quarter", Danone and Nestle owned by 3 each and Coca-Cola and Pepsi Cola owned by 2 each. The top five leading brands which have the largest realization in the world are Aqua (Danone), Pure, Lile (Nestle), Wahaha (Danone) and Aquafina (Pepsi Cola).

Chart 1 shows the countries with the largest sales of bottled water in 2015 and the expected sales of these countries in 2020. According to the data, China will remain the world's leading bottled water sellers by the quantity of the sale which in 2015 provided 17% share of it.

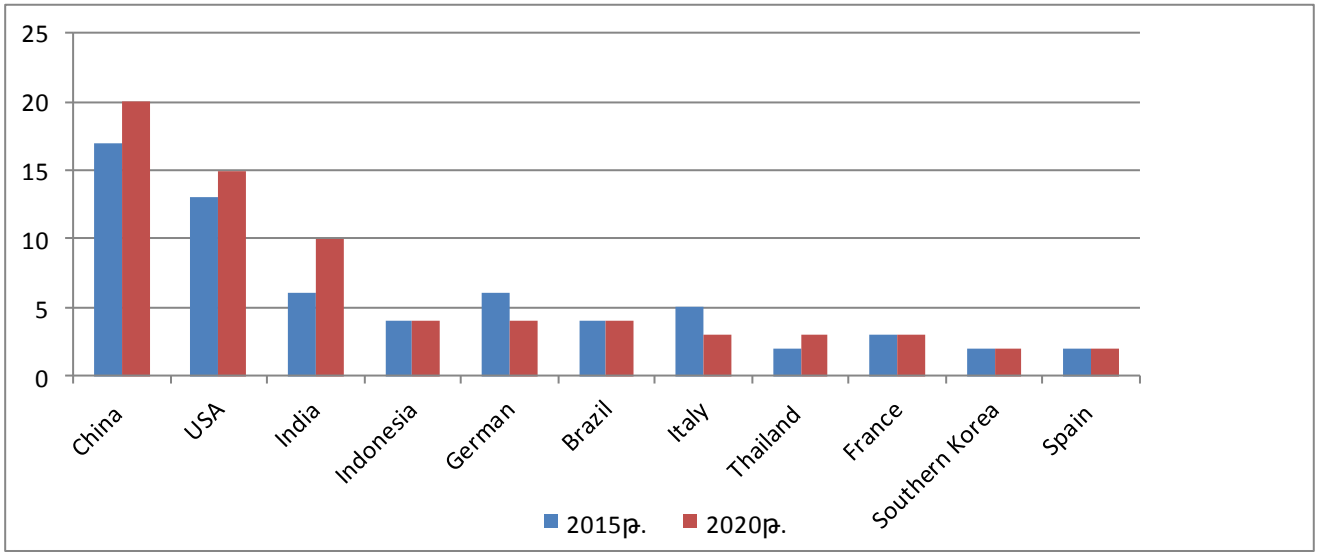

Chart 1. The countries with the greatest sizes of bottled water sale in 2015 and predictions for 2020 (%)

Source by https://www.statista.com/statistics/252208/global-bottled-water-volume-share-by-region/

According to the results of the study by the Business Research company, in the period of 2014 – 2017 due to the concern which occurred as a result of the threat of consuming the contaminated water the world market of bottled water grew for more than 200 billion USD thus providing 9% increase per year. Besides the concerns connected with the health threats the factor of directed incomes of the population of Asian and Pacicfic region significantly influenced the increase of the sizes of water consumption as the most bottled water consumers.

The market of bottled water increased in its size by 100 bilion liters, and the predictions of the increase for the coming years are greater. Due to the cost of bottled water it is predicted that in 2021 the market will be enlarged up to 350 billion USD (chart 2) which means providing 10% grow per year. Indeed, the grow in size will be a little lower - 9.3% per year. The world consumption of bottled water will also increase reaching in average 45.3 USD in 2021 per capita compared with 32.3 USD in 2017.

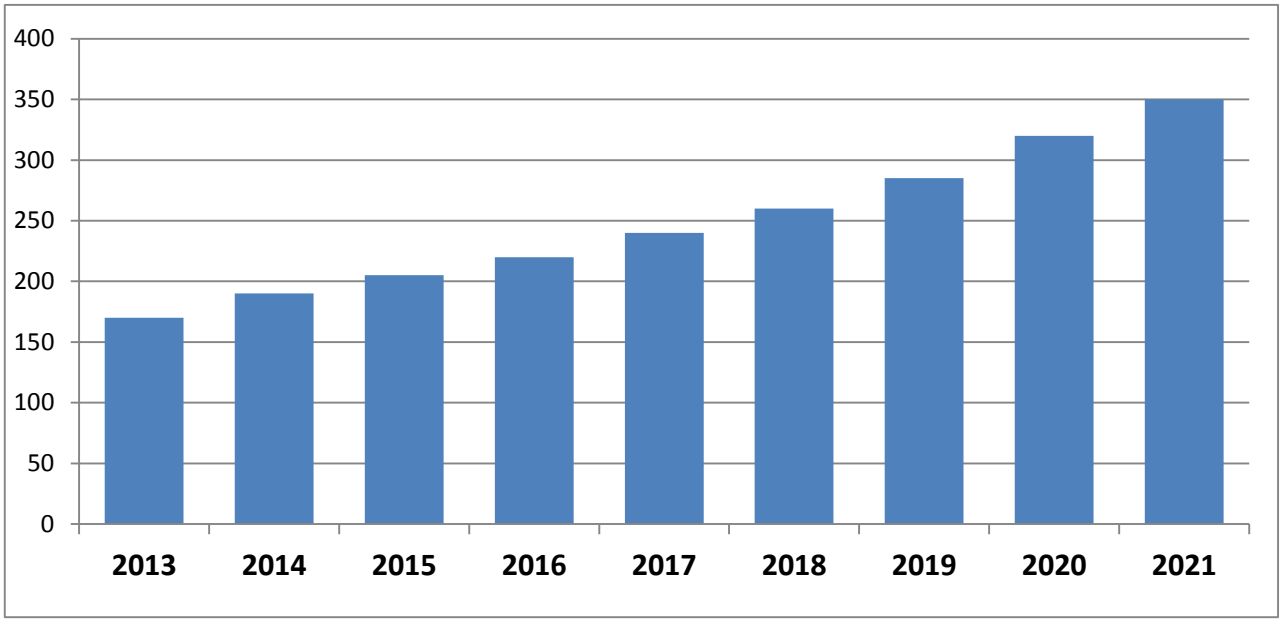

Chart 2. The sizes of world market of bottled water in 2013-2021, billion USD

Reference https://blog.marketresearch.com/the-global-bottled-water-market-expert-insights-statistics

The consumption of bottled water was the largest in Asian and Pacific region in 2017 which comprised 42% of world consumption. This region is the most densely populated where public infrastructures are weakly developed and the availability of pure drinking water is limited. These conditions particularly trouble the consumers and become the reason to find clean drinking water and carry a healthy lifestyle.

The American continent occupies the second by the size of bottled water consumption. The average high price of drinking water sale per liter lead to the region to occupy the first place in the world by the water price.

The world market of bottled water is strictly segmented because of the presence of numerous local producers (bottlers) in the coutries. Taking into account the presence of many competitors the companies started to change the outward and design to provide their place and role in market. The purpose of the producers of these brands is to confirm their label and symbol differentiation in bottled water market.

To rise the attraction of the product innovative packaging is used both for processed and raw materials, transparent elegant bottles and paints for designing are used which have a unique visual impact on the consumers. The leading companies in the world market producing bottled waters which are presented in different countries are the following: Danone, Nestle, Coca-Cola and Pepsi-Cola[2].

[2] See https://blog.marketresearch.com/the-global-bottled-water-market-expert-insights-statistics

By the way, by saying «bottled water» we mean both the spring (non carbonated) and mineral (carbonated) waters. Carbonated bottled water has rather small density in general, i.e. only 10% of bottled water is carbonated all over the world. Totally, this ratio is reserved with certain deviations all over the world**.** However, there are countries where the mineral water is consumed more than world average, the reason of which is the habit of using mineral water during dinner or the low level of water utilization. Such countries are Argentine, Chili, Urugway, the Netherlands, Germany and Armenia as well [18:382-402].

If we accept that one liter of drinking water exported from the Republic of Armenia can be sold in world market by 0.37 USD (mind that the cost of one liter of drinking water in world market is equal to the cost of one liter of oil which has recently increased significantly and by 2018 October 22 it has comprised 0,5 USD)[3], then it is easy to notice that the money income (benefit) from the export of one mln liter drinking water (1000 cubic meter) will comprise 370 thousand USD. In case of exporting one mln cubic meter drinking water it is possible to get 370 mln USD, 10 mln cubic meter – 3.7 billion USD which exceeds the exporting size of the RA in 2017 for more than three times. Such amount of water can be taken from Lake Sevan and be exported through pipeline till the Persian Gulf. It is also important to notice that the water amount can be reached the nearby countries by its gravity taking into consideration that the Republic of Armenia has 700 meters higher elevation above sea level according to its geographical position than the countries of the Persian Gulf which will significantly reduce the expences of water transportation. By the way, to realize the mentioned programme it is purposeful to create a consortium on the means of those countries which would like to use the potable waters of the RA as they did in the neighboring country, in Azerbaijan during the export of oil and gas.

It is evident from above mentioned that to manage efficiently the water resources of the RA it is necessary to elaborate a long term purposed project for complex utilization.

Yet in 2000 the demand and the offer of potable water were equalized in world scale and now by progressive demand the disbalance is growing year by year. All these show the importance of water as irreplaceable natural resource. The demand of water increases as time passes and in some territories of the world the collisions between the countries became frequent because of water.

One of the relative and most important advantages of the Republic of Armenia and the region are underground and surface waters. It is enough to mention that 7.5 billion cubic meters water is emerged in the territory of the RA annually (without underground supplies) from which only 2,5 billion is used. The remained amount of that strategic resource, in fact, "is exported" to the neighboring countries with zero cost. All these dictate to have a program for water resources utilization and management in the Republic of Armenia where the activities will be determined and the realization of which makes it possible to reach the effective utilization of water resources.

The expanding of exporting amounts of drinking water from the RA gets special importance in the sphere of water utilization. The drinking water has become one of the important strategic products in abroad (one liter is sold for 0,37 USD at retail price), and the demand is growing on worldwide. It is predicted that in 2011-2012 the world amount of bottled water will reach 440 billion liter or it will increase by 170%.

The effect of water utilization is evident by the following example of economic multiplication as in case of 10 billion liters export we will have 3,7 mln USD income. It will exceed the total income of total amount of 2012 RA export for more than 2,5 times. If the export amount of drinking water from the RA reaches 10 billion liters, then it will comprise from 3,3% to2,3% of drinking water of world market (in case of demand in 2021). The rapid increase in the amounts of potable waters exported from the RA and among different issues to reach those aims are the inventory of the potential of Armenian drinking water, the exploring of markets, demand marketing, the segmentation of consuming groups and served drinking water type (carbonated or not) and the choice of cartoning size, the signing of long term agreements with trade organizations for drinking

[3] See https://news.yandex.ru/quotes/1006.html

water sale, the segmentation of market according to shelf life, choice of transportation means (by transport or by pipeline), making arrangemets with drinking water bottling companies etc.

While discussing the issues of expanding the export of potable water of Armenia and the ways of stimulating the export the following can be regarded:

- Export according to currently working conditions and projects.
- Export by isothermic – isobar tank wagons. This practice worked during previous Soviet Union period when Armenian mineral waters were transported from Armenia by isothermic – isobar tank wagons (60 tonnes capacities) and were bottled in Mitishchi soft drinks factory. We should notice as well that in European part of Russia there are no drinking mineral waters, so Armenian mineral waters will have great demand in Russian Federation especially in large metallurgic organizations where the workers lose the minerals out of their organisms.
- To extract the minerals from the mineral waters and export. The technology of extracting the minerals was used in neighboring Georgia according to which the mineral water drops on a disk rolling with great speed from above and from the «meeting» of the water drop and the disk the water drops are «spread» into thousands of particles, and in high temperature the water evaporates, the minerals existing in the water «stay» on the floor of the instrument like dust. The obtained dust can be solved in the water in the places of consumption or utilization and can be used for drinking or for medical bathing. The extracting of minerals is noted by its high efficiency as from 0,5 liters of mineral water we obtain 3-5 grams minerals. Besides, to transfer the mineral waters with glass bottles the trains are needed, and it is not economically profitable for more than 660 km distance.
- Armenian drinking waters can be reached to consumption market through pipelines. By this means the transported waters from the RA to Arabic countries can reach the consumers with more quantity thus organizing its bottling at site. In every case the choice of this or that way of exporting should be justified by appropriate professional calculations.

The amounts of sweet waters of Lake Sevan guarantee that the RA is able to provide large amount of exported waters making the water one of the utmost products of export and an important way of solving RA social economic issues.

Conclusion

The study done shows that the resources of drinking water are one of the comparative advantages of the Republic of Armenia having vital importance even now and their importance will be enhanced further on both in terms of satisfying the vital needs of the population of Armenia and from exporting perspectives. It is also evident that the demand for drinking water is increasing in the global market day by day raising its value. This circumstance makes it possible for Armenia to export its drinking water to the world market, and the money profit from it can exceed the amount of funds received from the export of Armenia nowadays. For that purpose it is proposed to elaborate a complex water resource utilization program of the Republic of Armenia which will lead to the increase of the efficient utilization of existing water resources and strengthen of the Republic.

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ՀԱՅԱՍՏԱՆԻ ՀԱՆՐԱՊԵՏՈՒԹՅԱՆ ՋՐԱՅԻՆ ՌԵՍՈՒՐՍՆԵՐԸ ԵՎ ԽՄԵԼՈՒ ՋՐԻ ԱՐՏԱՀԱՆՄԱՆ ՀՆԱՐԱՎՈՐՈՒԹՅՈՒՆՆԵՐԸ

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[2]Երևանի պետական համալսարան

[3]Հայաստանի ազգային պոլիտեխնիկական համալսարան

Սոցիալ-տնտեսական զարգացմանը նպաստող արտադրության գործոններից բացի, կարևոր է նաև տնտեսական շրջանառության մեջ ընդգրկել բնական պաշարները (այդ թվում՝ ջրային) և այդ նպատակով ստեղծել պայմաններ, որոնք կնպաստեն բնական ռեսուրսների արդյունավետ օգտագործմանն ու կառավարմանը: Եվս մեկ կարևոր խնդիր է ՀՀ ջրային ռեսուրսների օգտագործումը կազմակերպել ելնելով երկրի տնտեսական շահերից:

Ինչպես տնտեսական առաջընթացի, այնպես էլ բնակչության կենսամակարդակի բարձրացման գործում երկրի հիմնական ուղին արտադրության գործոնների ավելացումն է, որը Հայաստանի Հանրապետության նման բաց և փոքր տնտեսություն ունեցող երկրում զգալիորեն կախված է արտահանման ծավալների ավելացումից ու երկրի համեմատական առավելությունների օգտագործումից:

Հեղինակների կողմից կատարված ուսումնասիրությունը վկայում է, որ ՀՀ համեմատական առավելություններից են խմելու ջրի պաշարները, որոնք համաշխարհային շուկայում օրեցօր ավելի են արժևորվում: Այս հանգամանքը նոր հնարավորություններ է ստեղծում ՀՀ համար՝ խմելու ջուրը համաշխարհային շուկա արտահանելու և արտահանումից ստացվող միջոցներն ավելացնելու տեսանկյունից:

Բանալի բառեր. ազգային հարստություն, ջրային ռեսուրսներ, ջրառ, ջրօգտագործում, ջրային ռեսուրսների կորուստներ, խմելու ջուր, շշալցված ջուր, արտահանում, համեմատական առավելություն:

ВОДНЫЕ РЕСУРСЫ РЕСПУБЛИКИ АРМЕНИЯ И ВОЗМОЖНОСТИ ЭКСПОРТИРОВАНИЯ ПИТЬЕВОЙ ВОДЫ

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Помимо факторов производства, способствующих социально-экономическому развитию, очень важно также включать в экономический оборот природные ресурсы (в том числе - водные) и создавать

условия, которые будут способствовать эффективному использованию и управлению природными ресурсами. Еще одна важная проблема - использование водных ресурсов в Армении с учетом экономических интересов страны.

Эффективное использование производственных факторов способствует экономическому росту и повышению уровня жизни населения, однако очень важным направлением является увеличение объемов экспорта и использование сравнительных преимуществ страны, в частности такой страны, которая обладает открытой и малой экономикой.

Исследование авторов статьи показывает, что ресурсы питьевой воды являются сравнительным преимуществом Армении, а питьевая вода с каждым днём все больше ценится на мировом рынке. Это обстоятельство создает новые возможности для Армении в плане экспорта питьевой воды на мировой рынок, увеличения объемов экспорта и доходов, получаемых от экспорта питьевой воды.

Ключевые слова: национальное богатство, водные ресурсы, водозабор, водопользование, потери водных ресурсов, питьевая вода, бутилированная вода, экспорт, сравнительные преимущества.

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