

# INTERCOUNTRY WATER TRANSFER

2014

# Peace River to Cyprus from Turkey



Hydropolitics Academy

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**HYDROPOLITICS ACADEMY**

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## **REPORT NO.:6**

**Title of Report :** Peace River to Cyprus from Turkey

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## **ABOUT THE REPORT**

Gas-politics and Hydro-politics in 21<sup>st</sup> century have been incorporated into Petro-politics which defined the policies in the cold war period. That state highlights the Hydro-geopolitics of the Eastern Mediterranean. Limited water resources is one of the factors which affects international relations in the Eastern Mediterranean. Therefore, it is important that rational management of water in the region and international co-operation programs be developed.

First and foremost step to render regional stability sustainable is building confidence, and implementing policies which are to ratchet up international co-operation and interdependency. Turkey's project to transfer water to Cyprus by a pipeline sets an example for the region to ensure that climate of confidence.

Water scarcity on the Island of Cyprus, which is even today going through a stress, is highly likely to become much worse with the impact of climate change. “The Water Transmission Project to Cyprus by a Pipeline” is a very important step forward for a co-operation to be created over water. Such a co-operation would raise the Hydro-politics and Geopolitics importance of the Island of Cyprus which has become a hub for transportation network of energy resources.

We wish that this report drafted by contributions of the members of Hydropolitics Academy in their respective disciplines would contribute to regional peace and stability.

Respectfully

***Executive Board of Hydropolitics Academy***

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## ***EXECUTIVE SUMMARY***

Scarcity of water resources highlights one of the factors which will continue to affect international relations in the Eastern Mediterranean. Transnational and regional scale co-operation programs are needed for the implementation of sustainable water policies in the region.

The first step to this end is building an environment of confidence by taking into account the rights of each country and acknowledging the decisive role of water in sustaining the regional peace and stability.

Seeking solutions which remains on the agenda in different parts of the world for a sustainable water management leads new co-operation policies in the international arena. Adoption of a rational water management policy is of high importance for these solution policies to be more effective. It is also important that countries in the region in this framework go for a co-operation for the future in water management of the Mediterranean region.

Global climate change makes rational management of water mandatory in the Eastern Mediterranean and throughout the world. New approaches toward water management must be taken in the shortest time possible. Turkey, taking a very important step in the water co-operation, has already linked a river from its geography to Cyprus. Turkey has implemented the Peace River Project assuming expenses in financial and technical areas as well as the security measures. Within that context, it would be a more rational policy for the international community to be in quest of co-operation over this project for the future of the region instead of denying Turkey's approach solely with a political rhetoric.

Total 125.98million m<sup>3</sup>/year of water is used in the TRNC, of which 24,65 million m<sup>3</sup> is for potable water and 101,33 million m<sup>3</sup> for irrigation. 18 million m<sup>3</sup> of that amount is sea water entering Güzelyurt aquifer due to excessive drawing of groundwater. It is estimated in the demand projections for 2035 that need for potable water and tourism and industrial water will be 54 million m<sup>3</sup>/year<sup>3</sup>. Having a total of 129,000 hectares of irrigable land, the TRNC will need 649 million m<sup>3</sup> of water should the whole area be irrigated with modern technologies<sup>4</sup>. Taking into consideration the fact that 101,58 m<sup>3</sup>of water presently has been consumed for agricultural irrigation and that low added-value of this water, a reality arises that entails a different approach in dealing with agricultural sector in the TRNC.

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<sup>3</sup> "TRNC Water Master Plan Report" Merkez Project Engineering Co. Ltd., Baget Engineering Consultancy Trade Co., Hidro Dizayn Engineering Consultancy Construction Tourism and Trade Co. Ltd., General Directorate of State Hydraulic Works, Office of Research and Plans. December, 2003, Ankara.

<sup>4</sup>ibid

In this context, selection of a specific pattern of a plant which acclimatizes with the climate and ecology of the Island and needs marginal amount of irrigation water poses a necessity. Regarding that, it would be technically and economically more rational to allot a ratio of 80% of water brought from Turkey for services sector.

Within this approach, rational, planful and productive use of water offers a huge opportunity in terms of socio-economic development of the Island and contribution to the resolution of political instability in the region. Recent developments in the Eastern Mediterranean region has further increased the importance of the Peace River Project in building regional cooperation and confidence.

Respectfully

**Executive Board of Academy**



*The past cannot be changed. The future is yet in your power.*

*Hugh White*

## **1. The TRNC's Water Potential and Water Utilization<sup>5</sup>**

### **Introduction**

With a size of 3,355 km<sup>2</sup>, the Turkish Republic of Northern Cyprus (the TRNC) constitutes one thirds of the Island of Cyprus. Country's economy by and large relies on agriculture, tourism (16,000 total bed amount) and education. The population is 286,000. As citrus underpins a great deal part of agricultural production, olive and vegetable production is being made for domestic consumption. Modern irrigation techniques are applied in the majority of irrigated agricultural land<sup>6</sup>. The modernization of irrigation systems has been implemented since 1998 for the effective use of water, and about 80% of it has been completed<sup>7</sup>. Prime Minister İrsen Küçük stated on 22 March 2011 that the drip irrigation system had been put into practice over the last three years in an area of 6,000 hectares<sup>8</sup>.



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<sup>5</sup>Yaşar, Doğan, Yıldız, Dursun, "Global Chess in the Eastern Mediterranean" Truva Publication, 2012, Istanbul.

<sup>6</sup> ASP, Agricultural Structure and Production, Ministry of Agriculture and Forestry, Department of Agriculture, TRNC, 1996-2003.

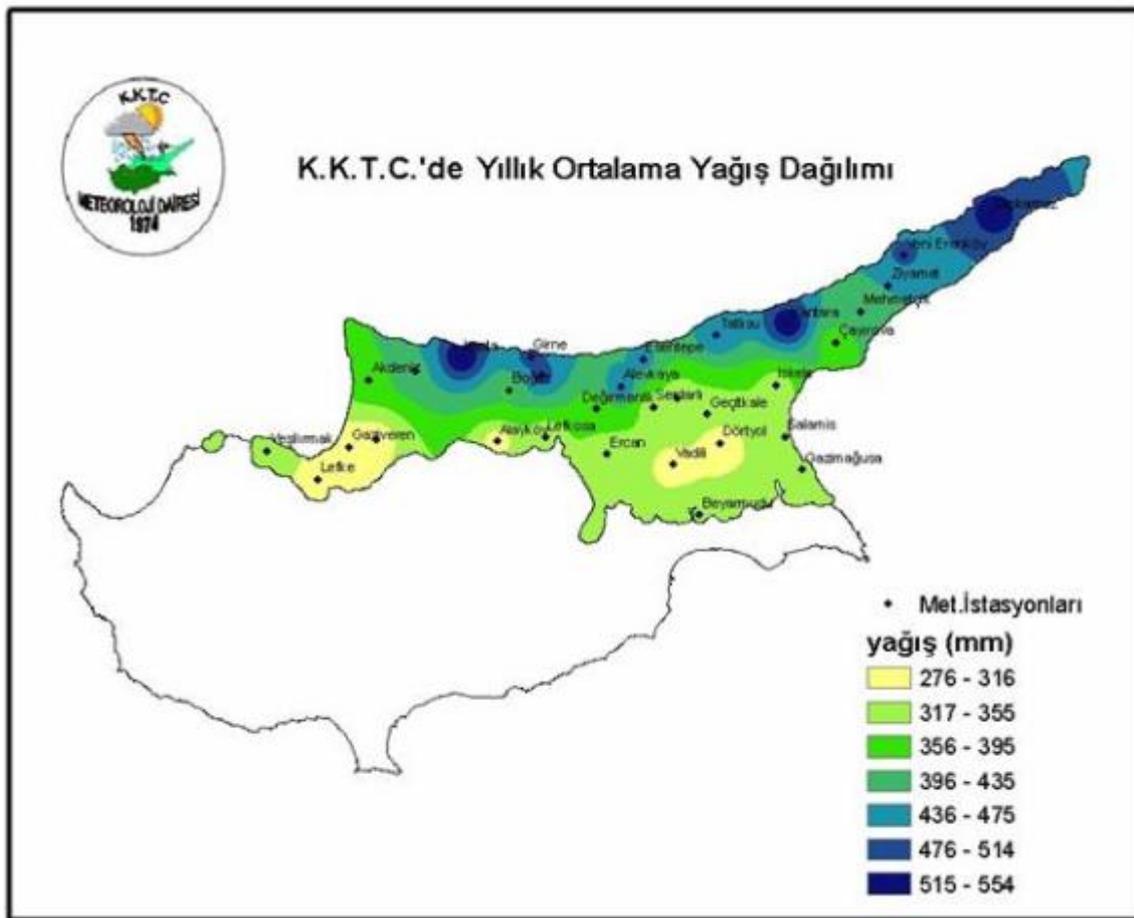
<sup>7</sup> ASP, Agricultural Structure and Production, Ministry of Agriculture and Forestry, Department of Agriculture, TRNC, 1996-2003.

<sup>8</sup><http://www.kibrispostasi.com/index.php/cat/35/news/49832>. Access 1 Feb 2014.

## Climate and Precipitation

The Island of Cyprus has an arid and semi-arid climate and rainfall is unsteady with regard to place and time. For instance, whilst 500 mm of annual average of rainfall is received across the Island, the amount the TRNC holds an average of 373.3 mm<sup>9</sup>. Amount of the evaporation which is an important element of water budget corresponds to 80% of annual precipitation average<sup>10</sup>.

Based on long-term average, annual rainfall falling on the entire Island of Cyprus varies between 250 mm and 720 mm<sup>11</sup>. However, this average of annual rainfall is reduced by 40% over 30 years due to climate irregularities. The aftereffect has reduced the amount of surface water flowing into dams by between 20% and 60%. None of the streams in the TRNC shows a continuous flow in a yearlong period<sup>12</sup>.



<sup>9</sup> <http://kktcmeteor.org/meteorolojikbilgi/kibris-iklimi.aspx>. Access 2 Feb 2014.

<sup>10</sup> Goymen, H. (b), Meteorolojik bilgi hk. Rapor. (no. M9/03/100), Bayındırlık ve Ulaştırma Bakanlığı, Meteoroloji Dairesi, TRNC, 2003.

<sup>11</sup> “TRNC Water Master Plan Report” Merkez Project Engineering Co. Ltd., Baget Engineering Consultancy Trade Co., Hidro Dizayn Engineering Consultancy Construction Tourism and Trade Co. Ltd., General Directorate of State Hydraulic Works, Office of Research and Plans. December, 2003, Ankara.

<sup>12</sup> Ibid

As seen from these facts, there is no dependable surface water stream available on the Island ,and water supply is secured relying on the rainfall that fosters the groundwater.

The Island suffers a hydrological drought at about 3-year intervals and during those times excessive volume of groundwater withdrawal has been done to supply water from illegal wells. Therefore, groundwater levels dropped low on the Island, and with sea water intrusion groundwater has salted and quality has deteriorated.

### **Streams and Groundwater**

There are no rivers which flow continuously throughout the year within the boundaries of the TRNC<sup>13</sup>. Precipitation in no time flows and brings about flows in the form of transient floods. With the end of rainfall, stream flow runs out. Streams originating from Troodos mountains in the south flow longer and more regularly thanks to snowmelt. Streams more usually transform into groundwater before reaching the sea and yet the flood torrents often reach the sea seeping into the aquifer.

Cyprus having a location in a semi-arid climate zone, existence of water is of vital importance for the country. Related to the dry period especially after 1990s, the TRNC has been increasingly suffering from a shortage of potable water in recent years owing to overexploitation of groundwater resources and then salinization.

Water resources to be utilized in the country is very limited. Almost all of the potable water is being met by groundwater. Main resource of potabewater supplied in the TRNC is from Güzelyurt (Morphou) aquifer groundwater. As a consequence of overexploitation of aquifers for many years, salinization have broken out from entrance of sea water. As a result, as of today, there has remained a very limited area which is not subjected to salinization along the coastline, and salinization has penetrated miles long into the inland area.



Meseria Plains

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<sup>13</sup> “TRNC Water Master Plan Report” Merkez Project Engineering Co. Ltd., Baget Engineering Consultancy Trade Co., Hidro Dizayn Engineering Consultancy Construction Tourism and Trade Co. Ltd., General Directorate of State Hydraulic Works, Office of Research and Plans. December, 2003, Ankara.

## Water Potential of the TRNC and Water Utilization

The bulk of the TRNC's water demand is supplied from groundwater resources. There are 41 water storage structures of various size built on the existing streams. Some of them are operated to recharge groundwater, while some serve for irrigation<sup>14</sup>.

As stipulated in the "The TRNC Water Master Plan Report" and as shown in Table 1, the TRNC has 3 larger groundwater basins. Total surface and groundwater capacity of these basins on an annual basis is 173.18 million m<sup>3</sup>.

**Table 1. The TRNC Water Balance Sheet**

Area	Drainage Size (km <sup>2</sup> )	Potential of Surface and Ground Water (Millionm <sup>3</sup> /yıl)	Usage		Discharge to Sea (Million m <sup>3</sup> /y)
			Potable Water(Million m <sup>3</sup> /y)	Irrigation (Million m <sup>3</sup> /y)	
Western Meseria (Meserya), Limnitis (Yeşilirmak), Lefke, Morphou (Güzelyurt)	1703,50 (Cyprus)  629.00 (TRNC)	65,13	11,60	71,53	1,70
Central-Eastern Meseria and Kyrenia (Girne) Mountains and the coast	2148. 00(Cyprus)  1898,70 (TRNC)	61,40	11,25	17,30	33,10  70 km coastal line
Karpaz Area	679,6 0(TRNC)	46,65	1,80	12,75	32,10  140 km coastal line
<b>TOTAL The TRNC</b>	<b>3299</b>	<b>173,18</b>	<b>24,65</b>	<b>101,58</b>	<b>66,90</b>

### Reference<sup>15</sup>

<sup>14</sup> Sidal, M., "Su kaynakları ile ilgili bilgiler", Rapor. (no. 2/95 (68/06)), İçişleri ve Köy işleri Bakanlığı, Su İşleri Dairesi, TRNC, 2006.

<sup>15</sup> Türkman, F., Elkıran, G., 2008, "Water Resources and Planning in TRNC- Kuzey Kıbrıs Türk Cumhuriyeti'nde Su Kaynakları ve Planlaması" TMMOB İMO 2. Congress on Water Policies Proceedings, Pg.425 İMO, Ankara.

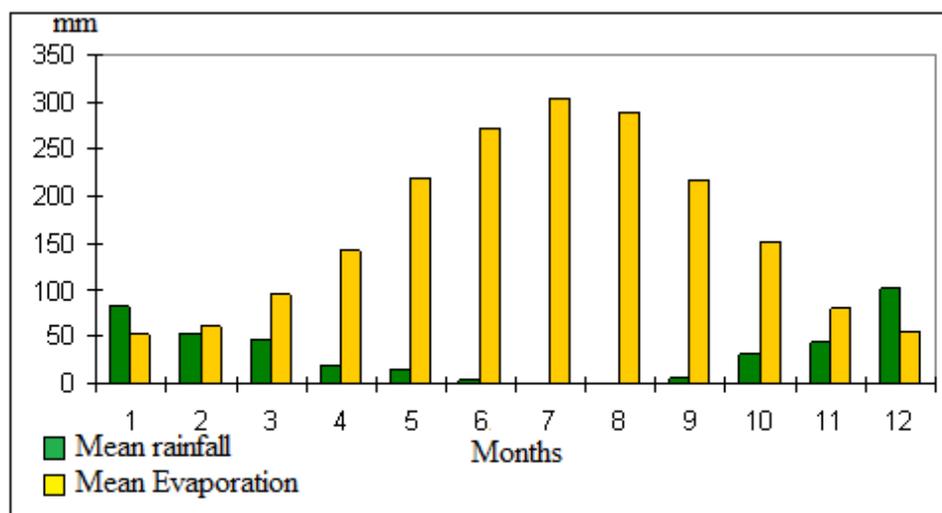
As shown in Table 1 total capacity of Western Meseria-(Lefke-Morphou (Yeşilyurt)), Central-Eastern Meseria (Meserya), Kyrenia (Girne) Mountains and the coast, and the Karpazarea is 173.18 million m<sup>3</sup>. 16.98 million m<sup>3</sup> of the this water is surface water, while 156.20 million m<sup>3</sup> is groundwater. However, 66.90 million m<sup>3</sup> of the groundwater is discharged into the sea along a 201 kilometer coast due to lack of capability to check for technical and financial reasons. Consequently, there remains 89.3 million m<sup>3</sup> of groundwater potential available. Of this, 18 million m<sup>3</sup> of water is sea water which intrudes Morphou aquifer.

### Storage Facilities

Attributable to low rainfall, very high evaporation and very small areas which take precipitation in the northern part of the Island, surface water storages (Dams, Ponds) seem not to constitute a suitable resolution to meet the demand for water. On the other hand, it is obvious that storages to be built to recharge groundwater will provide a progressive contributions to the water budgeted.

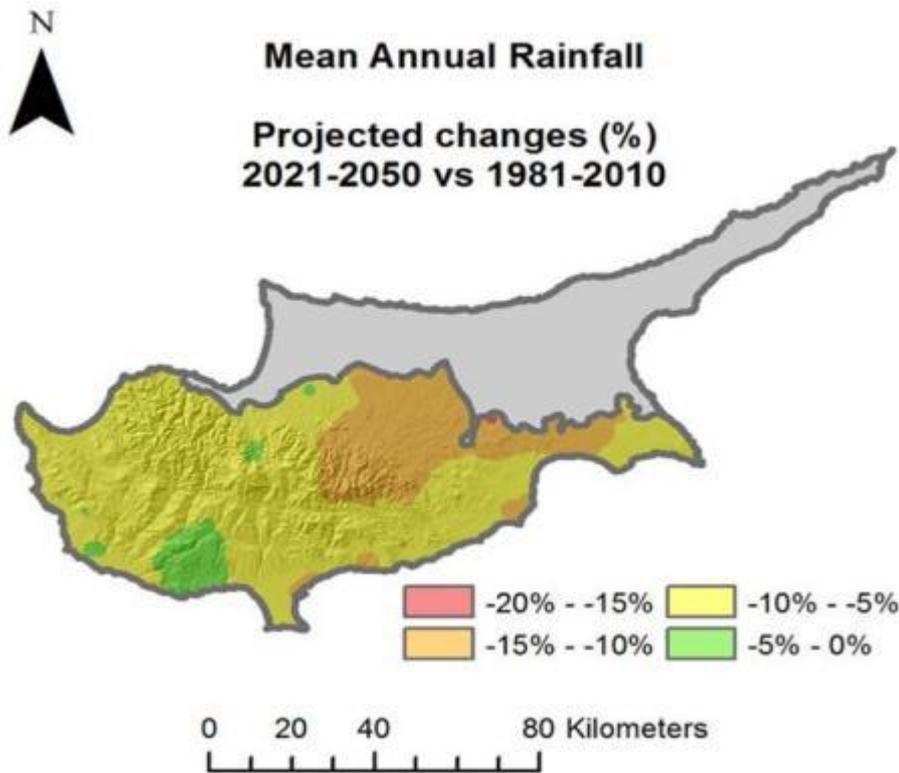


Figure 1. Precipitation and Evaporation in the TRNC



Source: KKTC Çevre ve Doğal Kaynaklar Bakanlığı  
Meteoroloji Dairesi Başkanlığı 4 Şubat 2014

Total holding volume of the 41 storage facilities in the TRNC<sup>16</sup> is 28,593 000 m<sup>3</sup>. These facilities are for irrigation and groundwater recharge. However, of these facilities the ones for collecting surface water appear to be not offering expected contribution due to a very high evaporation peculiar to the Island<sup>17</sup>. The main reason as indicated in Figure 1 is that average evaporation values particularly in the summer months is at very high levels.



### Potable-Tourism-Industrial and Irrigation Water Use

In the TRNC, totally 125.98m<sup>3</sup> of water is used per year of which 24.65 million m<sup>3</sup> for potable, tourism, industrial purposes and 101.33 million m<sup>3</sup> for irrigation. Of this water, 109 million m<sup>3</sup> (of which 18 million m<sup>3</sup> is from sea water intrusion) is groundwater<sup>18</sup> and 16.98 million m<sup>3</sup> is surface water.

Practically entire demand for potable, tourism and industrial water is met by groundwater in the TRNC.

Fractional distribution of consumption of potable, tourism and industrial water in the TRNC is depicted in Fig.2<sup>19</sup>. Here is shown that the leakage loss rate in the network is about a higher

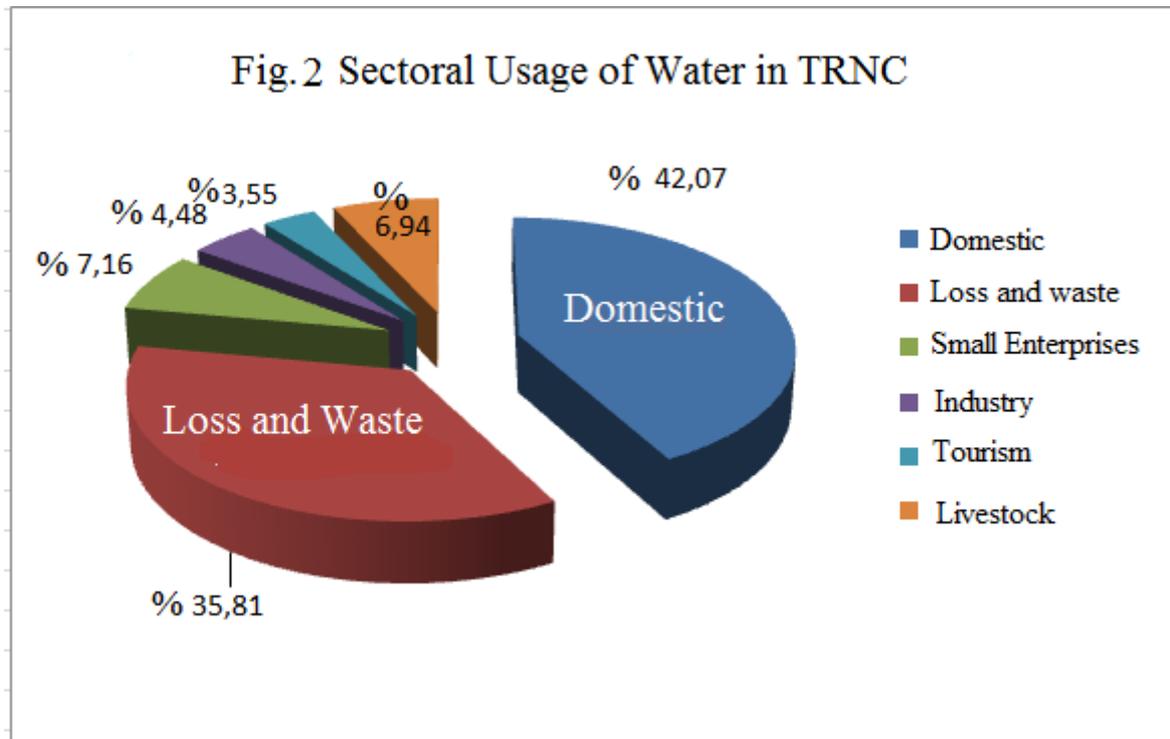
<sup>16</sup> “TRNC Water Master Plan Report” Merkez Project Engineering Co. Ltd., Baget Engineering Consultancy Trade Co., Hidro Dizayn Engineering Consultancy Construction Tourism and Trade Co. Ltd., General Directorate of State Hydraulic Works, Office of Research and Plans. December, 2003, Ankara.

<sup>17</sup> Ibid

<sup>18</sup> Ibid

<sup>19</sup> Ibid

value of 36%. That is why reducing leakage loss rates at least at about a level of 10% is mandatory on the Island where water is of vital importance.



Agricultural land assets the TRNC possesses is designated in the TRNC Water Master Plan. In the case of irrigation of a portion (129,272 ha) of country’s agricultural land which was studied under the Master Plan, water demand will be 679,788,601 m<sup>3</sup> (20). This amount of water demand scrutinized with the potential of the TRNC's water resources cannot be afforded technically and financially and not feasible to be transferred from abroad. Therefore, initiating new agricultural land for irrigation in the country will not make a rational policy. Instead, it would a more rational and visionary preference to encourage ecological agriculture compatible with the climate of the Island and give weight to Drinking Water Supply and Services Sector in water allocation as well as treatment and reuse .

### **Desalination Plants on the Island**

It has proved that water obtained from sea water desalination plants across the world is not a proper solution for a long-term sustainable water management. However, these plants offer local and partial solutions where and when is strictly necessary. Environmental problems caused either by greenhouse gases generated by thermal power plants to meet huge energy requirements of these facilities or by disposal of high density salty water and storing residual

<sup>20</sup> “TRNC Water Master Plan Report” Merkez Project Engineering Co. Ltd. Baget Engineering Consultancy Trade Co. Hidro Dizayn Engineering Consultancy Construction Tourism and Trade Co. Ltd. General Directorate of State Hydraulic Works, Office of Research and Plans. December, 2003 Ankara

salt waste at the same site have demonstrated that these facilities are not a rational and sustainable resolution for water provision.

The capacity of desalination plants in the TRNC is very low. There are some small private desalination plants in the TRNC, being one in Bafra with a capacity of 730,000 m<sup>3</sup>/year, one in the Eastern Mediterranean University with a capacity of 365,000 m<sup>3</sup>/year and one in Kyrenia (Girne) with a capacity of 545,000 m<sup>3</sup>/year<sup>21</sup>. Five desalination plants in the Greek Cypriot Administration of Southern Cyprus are operational with total capacity of 80 million m<sup>3</sup>/year in Dhekelia, Larnaca, Lini and Limassol, while 2 more treatment plants have been planned with a capacity of 35 million m<sup>3</sup>/year in Vasilikos, Paphos.

### **Water Budget Deficit in the Island of Cyprus**

Currently, there is a huge gap between water demand and natural water supply in the entire Island of Cyprus. On the other hand, water demand is increasing due to economic growth and social developments. Today, the deficit in the water budget is being met by unsustainably overexploitation of aquifers and partly by purified sea water particularly in the Greek Cypriot Administration of Southern Cyprus. Overexploitation of groundwater inflicts irreversible or even irremediable environmental havoc allowing sea water intrusion. Water stress will emerge as a much bigger issue in the probable more dry periods to come and will directly impact the socio-economic future of the Island.

### **Projection for Water Demand for Year 2035**

In the TRNC Water Master Plan, it is estimated that TRNC's population would come up to 350,000 in 2035. Taken into account the sectorial water demand for 2035, water need for domestic, tourism and international education institutions is estimated to be 54 million m<sup>3</sup>.

Another study<sup>22</sup> conducted on water resources planning in the TRNC indicates that this amount of water cannot be extracted from aquifers in a sustainable manner. It is figured out in the study which employed optimistic and pessimistic scenarios for dry and pluvial periods that annual 35-87 million m<sup>3</sup> in 2020 and annual 67 to 125 million m<sup>3</sup> of salified water in 2030 would be extracted from groundwater should an attempt be made to meet water demand merely through extraction from aquifers<sup>23</sup>. Extraction will result in aquifers to get filled up completely with sea water. Those projections reveal the importance of sustainable and rational water management on the Island.

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<sup>21</sup> Anthi Dionissia Brouma, SOAS, London Water Research Group Global Water Partnership-Mediterranean (GWP-Med). European Forum Cyprus Cyprus without water? One island, one problem and some related challenges, Barcelona, 14-15 November 2008, Council of Europe, European Union & IEMed.

<sup>22</sup> Türkman, F., Elkıran, G., 2008, "Water Resources and Planning in TRNC- Kuzey Kıbrıs Türk Cumhuriyeti'nde Su Kaynakları ve Planlaması" TMMOB İMO 2. Congress on Water Policies Proceedings, Pg.425 İMO, Ankara.

<sup>23</sup> "TRNC Water Master Plan Report" Merkez Project Engineering Co. Ltd. Baget Engineering Consultancy Trade Co. Hidro Dizayn Engineering Consultancy Construction Tourism and Trade Co. Ltd. General Directorate of State Hydraulic Works, Office of Research and Plans, December, 2003 Ankara

## The Importance of Water in the Region

The increasing importance of water with regards to the Island's lack of water resources and developments in the region have increased the prospects of contribution to peace and stability in the region that water provision from Turkey could make.

Turkey in December 2011 commenced to build the "*Peace River Project*" and presently resumes the project with a high pace. That the project would be completed in 2014 was announced. Through a good planning, water to be supplied to the Island could be used to meet not only the potable water demand of the TRNC but also a larger portion of that of the entire Island. Efforts to meet potable water needs of the Island through resources Turkey owns are the efforts to increase cooperation.

Turkey is striving to build confidence between both sides on the Island using water as a tool for cooperation for the regional stability. Turkey has materialized the project having undertaken the whole costs and measures in the same vein.

Earlier, Turkey had completed a facility to provide 180 million m<sup>3</sup> of water annually through sea from Manavgat. Manavgat Water Supply Project and the Cyprus Peace River Project are those Turkey has developed for a contribution to create an environment of stability and confidence in the region rather than an economic return.



Eastern Mediterranean due to its distinct physical settings is a region in which interaction among international relations, development and water retains unique qualities. Increased water scarcity due to climate change in the region will adversely affect the socio-economic development. These circumstances are likely to exacerbate the existing problems in the region where stability and security inherently is already under perpetual threat. Under these conditions, it comes into the picture that sustainable use of resources with water co-operation is to have an important role in the development and stability of the region.

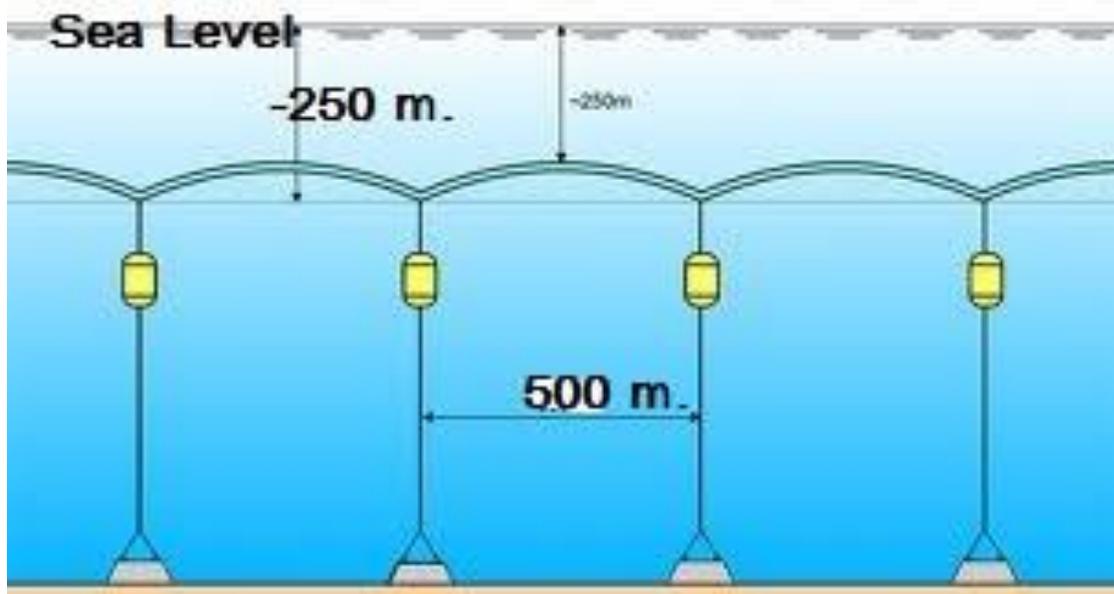


## 2. Peace River Project to Cyprus

Consultancy services of the project was tendered in 1998 and completed in 1999. The construction contract was made in 2012 after 13 years.



A flow rate of 2.83 cubic meters per second from Alaköprü Dam which will be built on the Dragon River in Anamur will be the first in the world with an application to carry water to Cyprus through a high density polyethylene pipeline suspended 250 m below sea level. Diameter and wall thickness of this 80 km pipeline between Turkey-Cyprus is 1600 mm and 62 mm respectively and pipes will be placed afloat at 250 meters below the surface level of the sea.



Alaköprü Dam and a Hydroelectric Power Plant, approximately 90 m in height, on the Turkey side were constructed for the water to be provisioned. A total of 131 million m<sup>3</sup> of water is to be stored in this dam.

It has been planned that, of 75 millionm<sup>3</sup> of water to be forwarded annually to the TRNC from Turkey, approximately 38 million m<sup>3</sup> will be allocated for potable water after purification in the treatment plants which will be built, whereas remaining 37 million m<sup>3</sup> is for irrigation of Mesaria Plains<sup>24</sup>.



<sup>24</sup> www.dsi.org.tr



According to the initial plan, of 54 million m<sup>3</sup> of water demand envisaged for 2035 in the Cyprus Water Master Plan, 38 million m<sup>3</sup>/year will be met by water carried from Turkey by pipeline, whereas remaining 16 million m<sup>3</sup> will continue to be met by currently available groundwater resources<sup>25</sup>.

Population of the TRNC which is currently 286,000 is estimated to go up as high as 350,000 in 2035. Current demand for potable and industrial water being approximately 33 million m<sup>3</sup> is estimated to be a total of 54 million m<sup>3</sup> in 2035.

Given the amount of water to be provided with Cyprus through "**Peace River Project**" is expected to be 75 million m<sup>3</sup> per year, should an efficient use of water be ensured, it would also be possible to allocate it for the other parts of the Island.

**Turkish and the TRNC Authorities: “The Project is a peace Project for the entire Cyprus”**

That the project to carry water from Turkey to the Turkish Republic of Northern Cyprus is a peace project and that the water is to come a water of peace has been stated since the signing ceremony by both the Turkish and TRNC authorities continuously.

For instance, drawing attention that the project would cost 450 million dollars, Minister of State and Deputy Prime Minister Cemil Cicek in a speech at the signing ceremony on 20 July 2010 said that the basin would become a basin of civilization with the arrival of the water along with a 150 million dollar energy project, and that “the signature we put is Peace Water Project”.

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<sup>25</sup><http://yonetim.dsi.gov.tr/hizmet-alanlari/hizmet>, Accessed 9 Jan 2012

Forestry and Water Affairs Minister Prof. Dr. Veysel Eroğlu who spoke on March 30, 2012 at a groundbreaking ceremony of Geçitköy Dam, Cyprus leg of the Project, in the TRNC said that the water to come to Geçitköy Dam would flow to entire Cyprus as a water of peace.

In addition to politicians and bureaucrats from Turkey, Hamid Bakirci, who is Environment and Natural Resources Minister of the Turkish Republic of Northern Cyprus, said while making his assessments to A Haber news on 29 April 2014 on key issues such as natural gas and water which are in the center of the negotiation process, that *"we are willing to share the water from Turkey with our neighbor in the south"*. Minister of Agriculture and Natural Resources of the TRNC Amcaoğlu told France 3 news that *"we are ready to share the water"*.

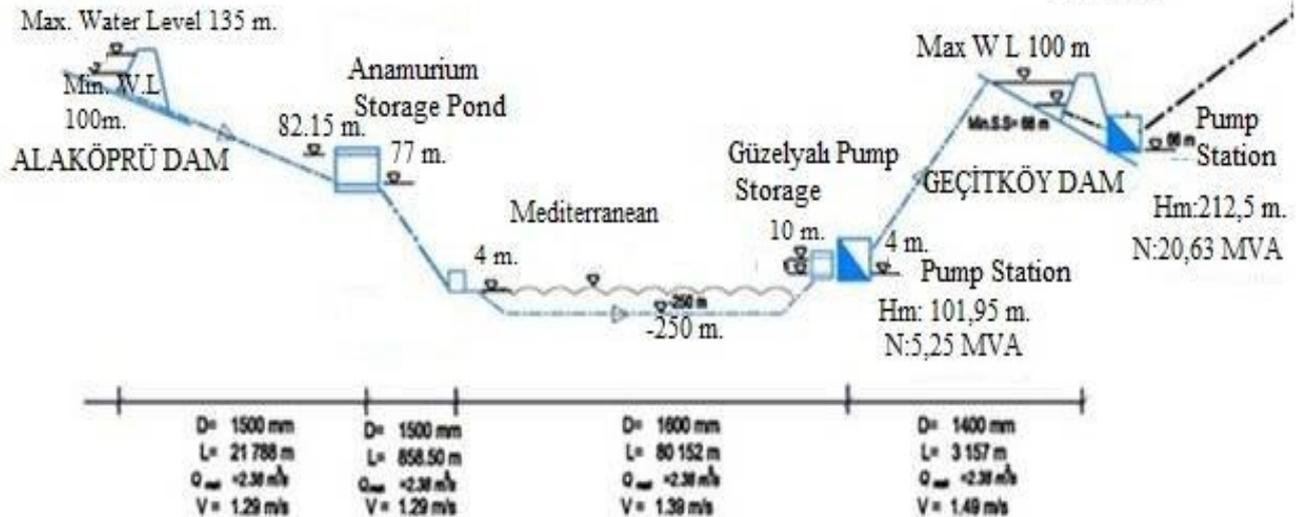
## Project

Alaköprü Dam, being built at a height of 88 m from the river bed and having a 130.5 million cubic meters of total storage volume, on Dragon River in Anamur district of Mersin is the main repository of this project. This dam has been planned to produce 111.27 million kWh of electricity per year whilst providing irrigation water with Anamur and its surrounding villages. Foundation of Alaköprü Dam that constitutes the Turkish leg of the project was laid on March 7, 2011.

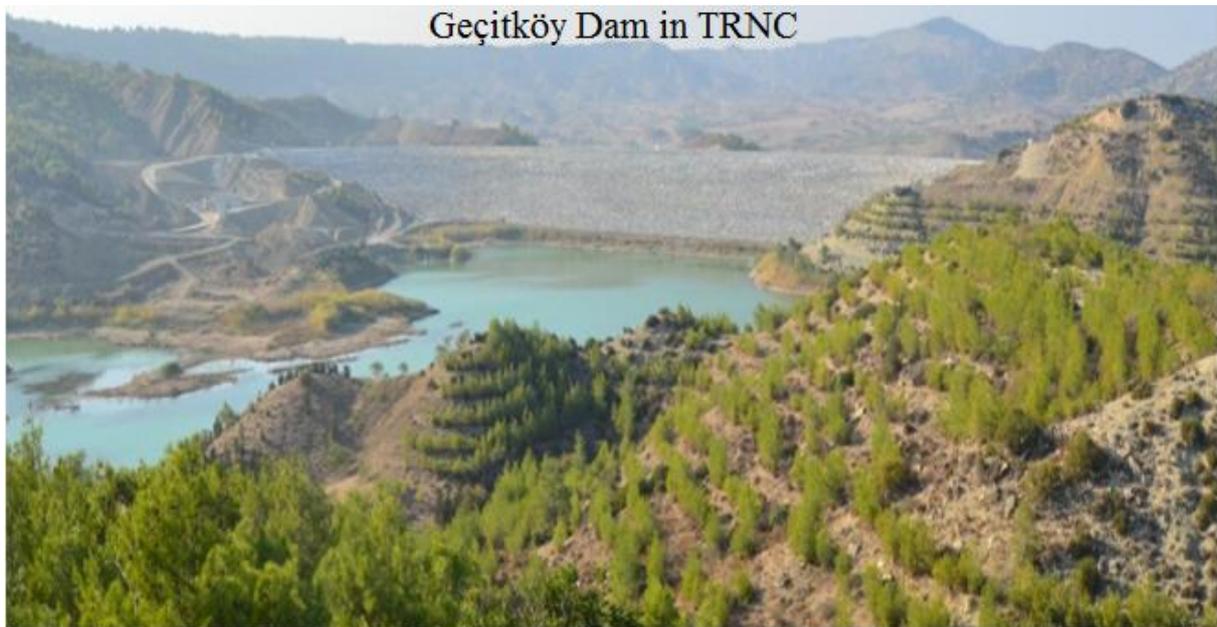


Water taken from the dam is carried to Anamurium Storage Pond of a volume of 10 thousand cubic meters through a 22 kilometer long and 1,500 millimeter wide bored ductile transmission pipeline. Water taken out from the storage pond is connected to the sea pipeline system with a one kilometer long pipe. Sea crossing of the Project is composed up of a 80 kilometers 151 meter long high density polyethylene pipeline with a diameter of 1600 mm and a wall thickness of 62 mm suspended 250 m below sea level.

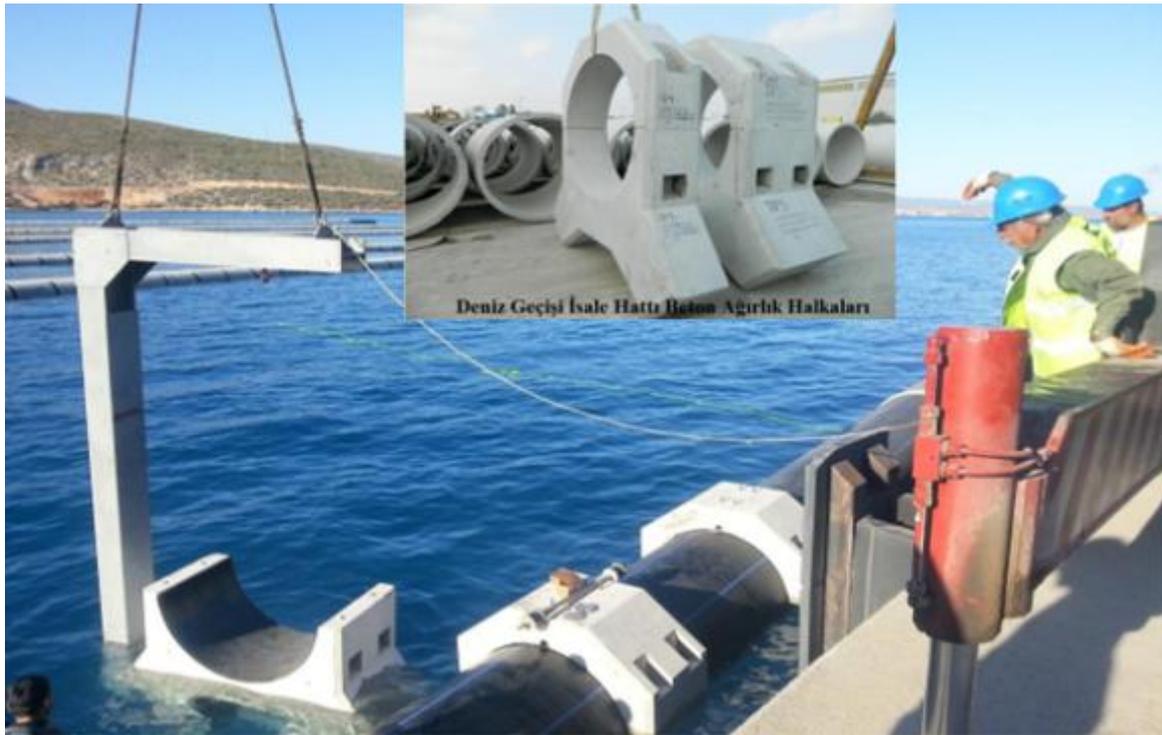
## Turkey



At the other part of the project in Cyprus are located Güzelyalı Pumping Station at a power of 6 megawatt, ductile pipe lifting line of 3,694 meter long and 400 millimeters in diameter, Geçitköy Dam having 26.5 million cubic meters of storage volume with a height of 58 m. from the river bed and 65 m. from the foundation, and Geçitköy Pumping Station with an installed capacity of 13 megawatts. The foundation of the Geçitköy Dam in Cyprus side was laid on 30 March 2012.



Water will be pumped to Geçitköy Dam through 3 km lifting pipeline with rate of 2.38 m<sup>3</sup>/sec. Water allocated for potable use with an average of 1.20 m<sup>3</sup>/sec. annually will be delivered to potable water pipeline by lifting through Geçitköy Pumping Station. 1.18 m<sup>3</sup>/sec. of water for agriculture will be stored in the Geçitköy Dam having 26.5 million cubic meters of storage volume with a height of 58 m from the thalweg to be used during the irrigation season. Foundation of Geçitköy Dam was laid on March 30, 2012. The construction of pipelines began in October 2012.



## Progress of the Project



**The ship will launch a total of 8 voyages.**

In the TRNC Water Supply Project, as labor process kick started, operations to place the first block on the seabed was completed on 26 March 2014. Anchor blocks, suspension ropes and flotation buoys to allow for placement of high seas pipeline, which was the most critical and

difficult part of the project, began to be laid in March 2014. Dutch origin 'Fairplayer' ship with 14 anchor blocks each of which weighs 220 tons on its deck, shoved off the Port of Tasucu Seka on March 23 to perform the operation. The placement of the first block on the sea bed was completed on March 24 at 22.00 Hours.



Fairplay which has a lifting capacity of 900 tons would complete the operation through a total of 8 voyages. Ship places anchor blocks by using 2 remotely controlled installation instruments. 126 anchor blocks will be placed on the seabed during the operation each of which is estimated to take 9 days. Suspension ropes and buoys are mounted on these blocks. The first block will be submerged to a depth of 290 m, while the last block to 670 m.



**Anchorage concrete blocks**



Seka Limanı Stok Sahasına Getirilen Şamandıralar



Şamandıra Mafalanı

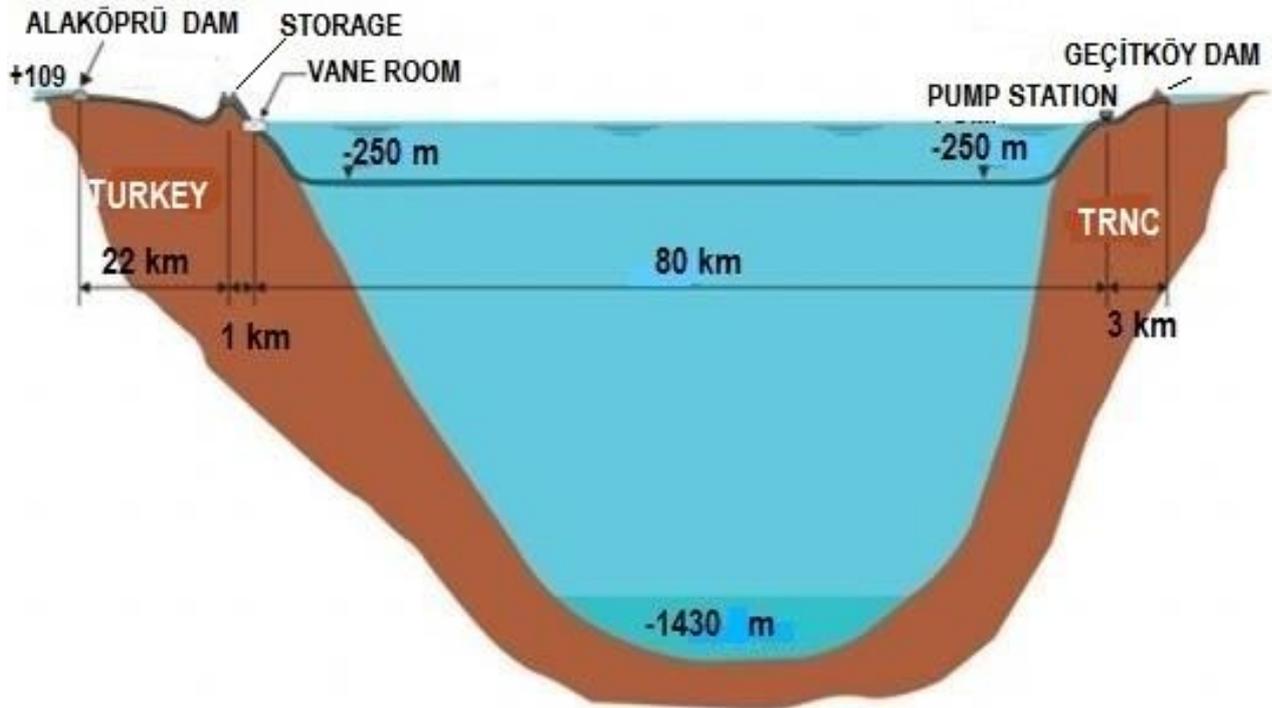


Askı Halatı İmalatı

### Cost of the project

Cost of the Project was announced to be TL 1 billion 117 million. TL 811 million was the tender price for the water to go to the TRNC. The remaining amount of TL 300 million would be used for the cost of water distribution network in the TRNC.





Forestry and Water Affairs Minister Prof. Dr. Veysel Eroğlu stated that the total cost of the project was TL 1 billion 117 million, however with addition of the main distribution lines, it would rise up to about TL 1 billion 500 million.

He added that, of 1 billion TL 117 million, TL 811 million was the cost of total investment of the tender for the entire structure to deliver water to TRNC, while the remaining amount of TL 300 million as the cost of water distribution in the TRNC. He also said, they wished the water served a cause for peace in the Middle East and particularly in Cyprus.



### 3. Economy of the TRNC

Economy of Northern Cyprus since the beginning of the 2000s has experienced high levels of growth with an average of 6%. In recent years, the economic development have shown a great change from agricultural economy toward tourism and industry.

As in the other small island economies, in the Northern Cyprus, services sector forms the backbone of the economy. The services sector, holding an important place in the economy, has a share of more than 70% of Gross Domestic Product. Tourism and Higher Education are the most important sub-sectors in the services sector. Tourism and Higher Education sectors play an important and vital role in the balance of payments in the Northern Cyprus.

Locomotive of the economy is Tourism and Higher Education sectors in the Northern Cyprus. Net tourism revenues in 2014 are estimated to be \$ 500 million.

The agricultural sector which had an important place in the economy in the 1980s has lost its importance in the following years. It is seen that the agricultural sector whose share in the economy falling from 21% in 1985 to 5% in 2013 has gradually lost its importance in the economy.

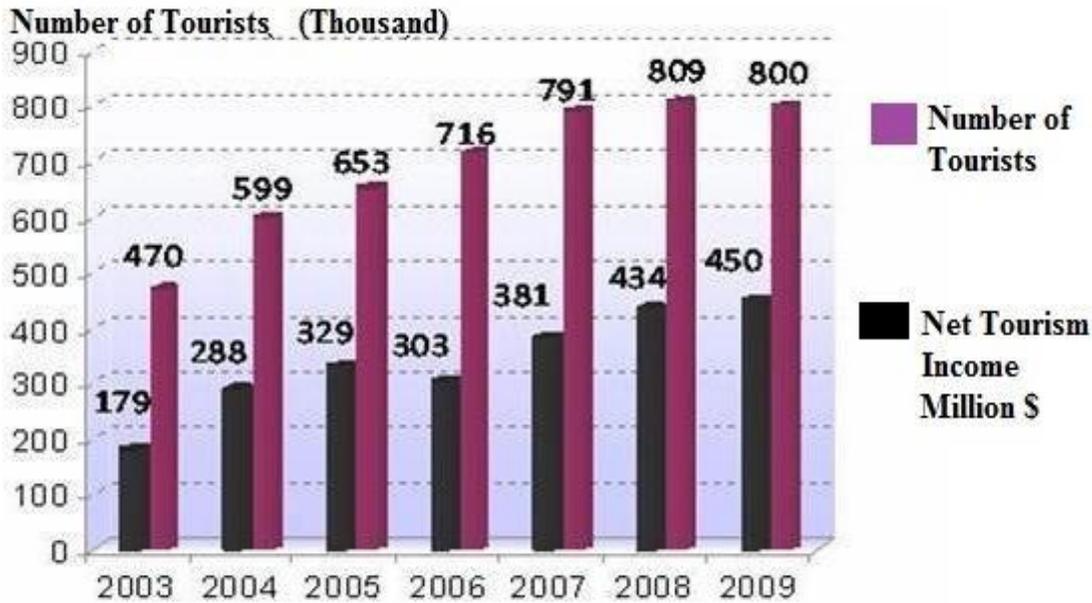
### **Tourism**

Being a leading sector in the TRNC, development of which is given special attention. Number of visitors in 2009 amounted to 800,000 and net tourism revenues to \$ 450 million. Tourism revenues in 2014 is expected to reach up \$ 500 million.

TRNC, in parallel with the increasing number of tourists, offers opportunities, such as eco-agro tourism, bird watching possibilities, golf, turtle monitoring, diving, historic sites seeing as well as many activities coupled with a variety of accommodation possibilities ranging from five star hotels and resorts to holiday villages and hostels with its 16,000 total bed amount. That amount is aimed to be increased by the Government of the TRNC to 50,000, which also adds up to an increase for the demand for water.

<b>YEAR</b>	<b>Net Tourism Revenues (Mil. \$)</b>	<b>Number of Tourists (Bin)</b>
<b>2003</b>	179	469,8
<b>2004</b>	288	599,1
<b>2005</b>	329	652,7
<b>2006</b>	303	715,7
<b>2007</b>	381	791
<b>2008</b>	434	808,7
<b>2009</b>	450	800,3

Number of Tourists and Net Tourism Income in the TRNC



### Higher Education

The TRNC has set a goal to become the region's most prestigious Higher Education Center. This goal has proved to be very accurate and planful as promising developments have been achieved. Over 50 thousand students from 65 countries are studying in nine universities which are operational in the TRNC. Revenues derived from education sector have been growing and with \$ 500 million in 2013 has it reached 13% of Gross Domestic Product. Higher Education sector in the Northern Cyprus is an important source of income contributing to the current account balance.

This sector is expected to further improve with participation to the European Union's Erasmus, Socrates programs and the Bologna Process.

### Agriculture

Having been the largest source of employment in the 1980s, the importance of the agricultural sector in the economy has declined over the years. The share of agricultural products barring processed products, in 2009 was at a level of 29.7% in the total export revenue. While the share of agricultural products in the GDP was 6.4% in 2009, and the share in the employment was at a level of 4.8%, it dropped to 5% in 2014 in the GDP.

## 4. The New Cyprus, "Energy and Water" will Shape

In many of the riparian countries in the Eastern Mediterranean, and in the TRNC and the Greek Cypriot Administration, freshwater resources are scarce. Those scarce resources are also under the pressure of severe climate change, rapid population growth and sea water intrusion and industrial contamination and pollution. Most of the countries in the Eastern Mediterranean Region in terms of water resources is dependent on water from neighboring countries. Along with changes in the recent period in the geopolitics of the region due to natural gas and oil reserves, political tensions between countries have increased the strategic importance of water in the region.

Global and regional scale climate models reveal that the Mediterranean region is a region that will deeply be affected by global warming. In this context, temperatures tending to increase and rainfall to reduce in the long term will adversely affect the water cycle in the region.

That the lack of local fresh water resources exists, and that the basin countries have a common destiny in a closed geography and growing water problems in the Eastern Mediterranean entail co-operation in the region.

Latest developments in the Eastern Mediterranean have turned the region a laboratory on energy, water and food safety policies and correlations of these elements with each other.

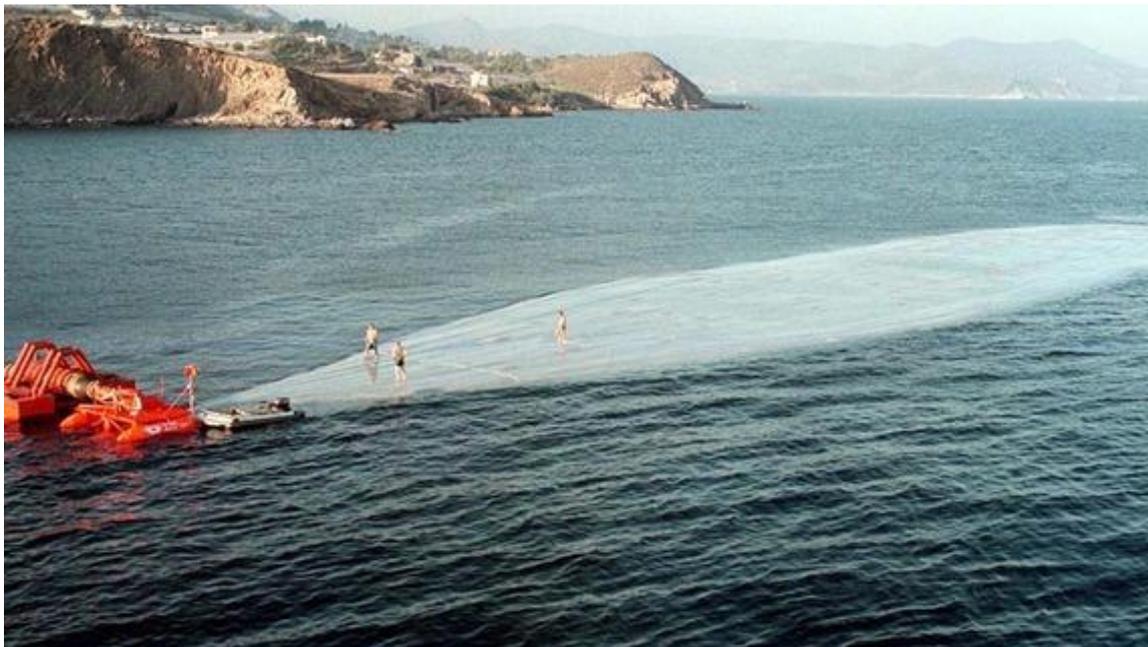
According to almost all climate change scenarios, which are sure to occur in this region, the water problem will directly affect food and energy security. The efforts of the countries to ensure water, food and energy security in the region will have a direct or indirect repercussions to regional balance.

### **Pentagon: 2023 Critical Year for Water Security in the Region**

A statement from the Pentagon in March of 2012 overshadowed the petro-politics of the region and revealed how important the geography is in terms of hydro-geopolitics. In this statement was a warning that the drought expected after 2023 would affect socio-political and all other balances in this region, and would create economic and social problems in these countries. Yet another warning came from the Minister of Forestry and Water Affairs of Turkey. In a statement Minister Prof. Dr. Veysel Eroğlu made in October 2014, he said, “we are making preparations for a probable drought in 2021”.

Cyprus, an Island in the Eastern Mediterranean is very strategic. That strategic importance, with the emergence of the new geopolitics of energy, has increased even more. Energy resources spotted around the Island of Cyprus has become a greatest beacon of hope in overcoming economic problems in the TRNC and the Greek Cypriot Administration.

The Southern Cyprus's immediate acceleration to extract energy resources over the last two years has also mobilized Turkey. Turkey on the one hand announced that it would protect its interests on energy resources, and on the other hand accelerated “Water Supply to Cyprus through Pipeline Project” which is of utmost importance for the Island.



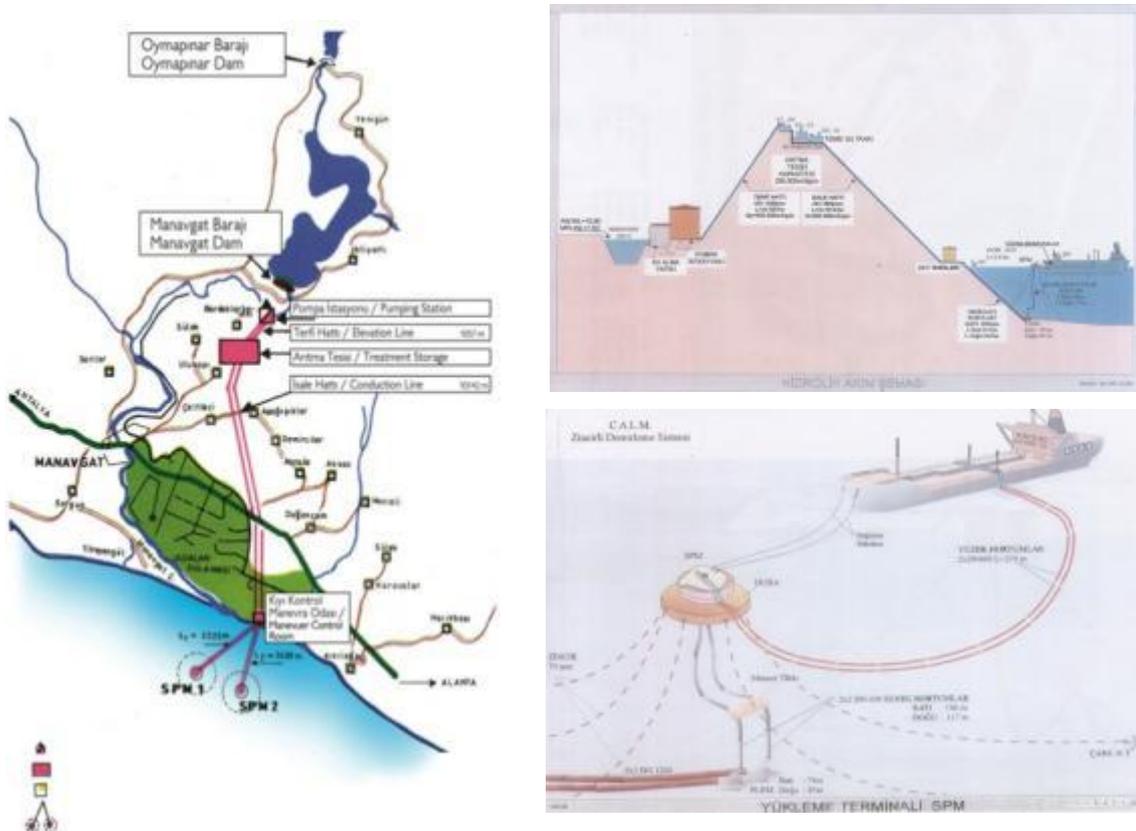
Medusa Bag

Previously, Turkey's initiative to carry water from the creek Anamur Soğuksu to the TRNC with water bags called Medusa Bags was activated in 1998. Transportation of water from Turkey with sea towable 10,000 and 40,000 m<sup>3</sup> of bags found feasible in 1998, and after a total of 2,850 million m<sup>3</sup> of water within 5 years was carried, the project was discontinued in 2002 due to technical difficulties encountered.



### Carrying water with Medusa Bags to the TRNC

Although the Manavgat Water Supply Project was completed, it could not be commissioned for carrying water to the Eastern Mediterranean region. Upon this, this facility was replanned to be used to provide potable water within its surroundings in the country. Energy mobility in the South had an effect revitalizing Water Supply Project to Cyprus through Pipeline which was on the agenda of Turkey for 16 years.



Manavgat Water Supply Project

The southern energy and water projects in the North have led to the arrival of two basic strategic sources of life to the Island which it has been thirsty of for a long time. The new water and energy geopolitics that these developments have revealed will shape the future of the Island of Cyprus decisively. It can be foreseen that a new era is just beginning in the relationship between the TRNC and the Southern Cypriot Administration. This new paradigm, with the impact of huge investments made by giant oil companies in the region and the great opportunity Israel has taken to become energy player will serve the stability of the region to be more permanent.

Turkey has proved to be a country which seeks cooperation and stability in the region through providing water with Cyprus.

Galvanizing production of global oil giants from Exxon Mobile to Gazprom and international partnerships the companies from Israel and Egypt went into with those companies have increased the quest for a lasting security and stability environment in this region.

Therefore, the region is reshaped with the dynamics of new geopolitics. In this context, a new Eastern Mediterranean that is shaped by the energy and water will have emerged in the near future.

### **Island of Peace Water: Cyprus**

The countries and the islands bordering the Eastern Mediterranean are still suffering physical water problems. Many of these countries are dependent on water from neighboring countries in terms of water resources.

Among the regions expected to be adversely affected by global climate irregularities is the Mediterranean region. Climate change scenarios reveal that average annual precipitation will be reduced by 10 times and temperature will increase in the region in the medium term. This, as well, will make water particularly a conflict or a co-operation tool in this basin.

According to all optimistic or pessimistic scenarios, there will be on a going-forward basis a water problem in this region. Water issues in the basin will negatively affect regional balance and have a direct or indirect repercussions toward destabilization of the region.

These developments indicating the increase of importance of water management in the region have mobilized Turkey who has the longest coasts. Decision on this project was taken by the Council of Ministers in 1998 and Feasibility Report was approved in 1999. After this date progress on the project has decelerated. However, Turkey completed the project having decided in 2012 to finalize it quickly within a short time.

Rapid developments in Cyprus will occur based on water along with this project. The Island of Cyprus in the near future will contribute to the stability in the region with acquired energy and water resources it has lacked.

## 5. Conclusion

Peace River Project being the first in the world either in terms of the high technology used in planning, design and construction phase or in terms of the size of the project has provided with Turkey a great deal of prestige. This project which will create a very drastic change in terms of Hydro-geopolitics in the Eastern Mediterranean region will open new horizons in the economic development of the TRNC dependent on the water.

In this context, Turkey's Peace River to Cyprus Project is a visionary project that integrates water to technological progress, economic development and social welfare. For this reason the water linked to the Island of Cyprus must be utilized with this visionary understanding in order to ensure political and economic stability. For the future of Cyprus, rational use of water on a sectorial basis should come to the forefront. In this context, it would be possible to scale up the share of rapidly developing sectors of Tourism and Higher Education over % 50 in the GDP in a 10 year term.

Attributable to reduction of rainfall average by 40% over the last 30 years on the Island of Cyprus, share of agricultural sector in GDP has fallen to 6%. The results of climate models for the region reveals that precipitation will decrease significantly and temperatures will rise in the future. Therefore, in agriculture, water demand for vegetation will increase. Use of 50% of water in the Agricultural Sector as planned will stunt the development of Tourism and Education Sectors which would otherwise hold a crucial place in the development of the TRNC. However, use of water in a way not to exceed 20% of the peace water to be brought in the cultivation of value-added products in which Turkey is a net importer like walnuts, almonds, and sesame which need little water can be considered. This production will also make a significant contribution to employment and socio-economic development in rural areas.

Boosting total bed amount of tourism industry from 16,000 of today to 100,000 in the next 10 years in the TRNC has been made possible by Peace River Project. Likewise, it has become an attainable target to increase the number of students in Higher Education being approximately 50,000 as of 2013 to 100,000.

Peace River Project has also enabled to set very big goals by removing all the obstacles before the goals of the Tourism and Higher Education sector in the TRNC.

An implementation toward these objectives will result in an increase in tourism revenue of the present which is at about \$ 500 million to reach approximately \$ 3.2 billion, and that of Higher Education of \$ 400 million to \$ 1 billion, taking the total up to \$ 4.250 billion dollars per year.

This developments will enable the Island to come the fore worldwide as a tourist destination and Higher Education center. The tourism sector being a labor-intensive services industry, creation of 100,000 total bed amount will completely rule out unemployment problem in the TRNC.

Rate of increase that the Peace River Project brings peace and stability to Island will be in direct proportion with the rational use of water. This necessitates allocation of the Peace Water River Project to give a priority and intensity to potable water, Tourism and Higher Education sectors. As a result, allocation of water from this project to Tourism and Higher Education sectors should be a priority target. Consequently, the TRNC's rise to a level of

developed countries with a prosperity in high living standards and social welfare and its spread in popular base will allow for substantial contributions to the peace process in a positive way.

These two very strategic natural resources- water and energy- should be used by integrating with a strategic vision for the future, and peace and stability of the Island. The Peace River Water linked from Turkey will contribute to this integration. This will pave the way for co-operation sought to transport potential energy resources around the Island to the world market in the most economical way.

"Peace Water" project which could open the door to co-operation in the Eastern Mediterranean should be used for regional stability without prejudice subject to political considerations.

## Hydropolitics Academy:

### Peace River Flowing to Cyprus

*We, Hydropolitics Academy, present our listed views and proposals below on this issue to all respective institutions, organizations, and national and international audiences that;*

- The Peace River to Cyprus is an important step toward regional peace, stability, and stability of “the Eastern Mediterranean Energy Corridor” and should not be squandered away,
- It would be wise to acknowledge that the water which will flow to Cyprus crossing the Eastern Mediterranean is a milestone for the security of the Island,
- It is of vital importance to comprehend that carrying water to the Island is a visionary project in terms of serving peace and stability of the Island,
- That the management of the water brought to the Island is carried out with an exemplary “Integrated Water Management” is as important as bringing the water to the Island,
- For the future of Cyprus, rational use of water on a sectorial basis should come to the forefront. Within this context, it would

be more appropriate to allocate water primarily to rapidly developing Tourism and Higher Education Sectors,

- It is essential that efforts on this issue should be rapidly initiated in co-operation with the public and civil society,
- Necessary endeavors should be made that the water brought to the Island with a project very first in the world in terms of the scale and the technology start the ball rolling for social consciousness in consumption habits of water,
- It is a fact that the peace water will create synergy for the development, growth and the future of the TRNC. From this point of view, dynamic development, growth and security policies should be developed,
- That 80% of peace water should be used in the Drinking water supply, Tourism and the International Education Services Sector while of 20% is used for the agricultural production of value-added products with an export potential to Turkey is of vital importance for a wise and rational use of it.

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