

ORSAM WATER INTERVIEWS 2012

ORSAM SU SÖYLEŞİLERİ 2012

حوارات برنامج المياه التابع لاورسام عام 2012

CENTER FOR MIDDLE EASTERN STRATEGIC STUDIES
ORTADOĞU STRATEJİK ARAŞTIRMALAR MERKEZİ
مركز الشرق الأوسط للدراسات الاستراتيجية



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CENTER FOR MIDDLE EASTERN STRATEGIC STUDIES

History

In Turkey, the shortage of research on the Middle East grew more conspicuous than ever during the early 90's. Center for Middle Eastern Strategic Studies (ORSAM) was established in January 1, 2009 in order to provide relevant information to the general public and to the foreign policy community. The institute underwent an intensive structuring process, beginning to concentrate exclusively on Middle affairs.

Outlook on the Middle Eastern World

It is certain that the Middle East harbors a variety of interconnected problems. However, neither the Middle East nor its people ought to be stigmatized by images with negative connotations. Given the strength of their populations, Middle Eastern states possess the potential to activate their inner dynamics in order to begin peaceful mobilizations for development. Respect for people's willingness to live together, respect for the sovereign right of states and respect for basic human rights and individual freedoms are the prerequisites for assuring peace and tranquility, both domestically and internationally. In this context, Turkey must continue to make constructive contributions to the establishment of regional stability and prosperity in its vicinity.

ORSAM's Think-Tank Research

ORSAM, provides the general public and decision-making organizations with enlightening information about international politics in order to promote a healthier understanding of international policy issues and to help them to adopt appropriate positions. In order to present effective solutions, ORSAM supports high quality research by intellectuals and researchers that are competent in a variety of disciplines. ORSAM's strong publishing capacity transmits meticulous analyses of regional developments and trends to the interested parties. With its web site, its books, reports, and periodicals, ORSAM supports the development of Middle Eastern literature on a national and international scale. ORSAM supports the development of Middle Eastern literature on a national and international scale. ORSAM facilitates the sharing of knowledge and ideas with the Turkish and international communities by inviting statesmen, bureaucrats, academics, strategists, businessmen, journalists, and NGO representatives to Turkey.

ORSAM WATER RESEARCH PROGRAMME



About the Programme

Water is irreplaceable, valuable and one of the most important substances for the sustainability of the life not only for human beings, plants and animals but also for the whole ecosystem. The surface and ground waters are utilized for domestic, agricultural and industrial aims. However, there is a dual pressure over water sources due to the human activities and natural changes. Especially, in the places where water shortage is experienced, over-population, immigration from rural areas to urban, food security policies, growing socio-economic wealth, agricultural, domestic and industrial based contamination, the changes in precipitation due to the global climate changes, affects the hydrological cycle. Thus, the water sources are exposed to some changes in respect of their quantity and quality. While demand for water has been gradually growing up, in water stressed areas, the water supply stays stable. While the problems on the management of water resources are experienced, on the other hand the effects of environmental problems on water resources are gradually increasing. Turkey and its close environment, especially, the Middle East are the most influenced regions by such problems.

On the other hand, Turkey's relations with Euphrates-Tigris Basin riparian neighbours are very important when taken into consideration that Turkey has more than 40 percent of the water resources potential on the transboundary basins. In order to reach the political target which both Turkey and other riparian states pursue, of establishing regional stability, augmentation of welfare and deepening the relationship among the neighbouring states, it is essential for all the parties, to have good faith and knowledge based active cooperation in the water resources utilization. In addition, during the process of Turkey's EU candidacy, the agenda of harmonization of EU Water Framework Directive with her own national legislation will along with bring the future water policies to have a new content.

In accordance with the foregoing factors, "ORSAM Water Research Programme" was established on 1st January, 2011 within ORSAM, for the aim of presentation of the enlightening findings and the observations of the current developments on water issues of Turkey's close environment and in the worldwide, to the public opinion and to the decision-makers, which have been acquired by means of analysis.

In the studies of ORSAM Water Research Programme, the Middle East engaged issues are given priority as there is a big increase in the political, economic and social problems, due to the both climate changes and inefficient utilization of water sources in the Middle East and as existing problems in the water budget.

ORSAM Water Research Programme aims to produce new ideas that offer different political alternatives on water issues, to encourage and diversify the qualified studies of competent researchers and intellectuals from different disciplines in order to form vigorous solution offers and to support the development of water literature in Turkey.

In this scope, ORSAM Water Research Programme aims both, to facilitate the hosting of academics, the representatives of the non-governmental organizations, bureaucrats, statesmen, diplomats, strategists, journalists and businessmen, who studies on the water issues in region countries and to provide the sharing of informations and considerations of those, with the public opinion both in Turkey and in the worldwide.

PRESENTATION

Water is one of the most important substances which is irreplaceable for the entire ecosystem, valuable and provides continuity of life. However, there is a bilateral pressure on water resources both due to human activities and also due to the changes caused by the nature. Especially in the areas with water shortage; overpopulation, increasing number of rural-urban migration, food safety policies, rise of socio-economic prosperity, agricultural, domestic and industrial pollution, and the change of precipitation regimes due to the global climate change. As a result of this, water resources are undergoing a change with each passing day both in quantity and quality. Especially in the areas with water shortage, water supply remains the same while water demand is increasing day by day. On the one hand problems related to water resources management come up; on the other hand the impact of environmental problems on water resources is increasing with each passing day. Turkey and its immediate neighborhood, but especially the Middle East, are the areas where the aforesaid problems are observed the most.

“ORSAM Water Research Programme” was created within ORSAM on 1 January 2011. ORSAM Water Research Programme was created to follow current developments on water agenda across the world and in immediate neighborhood of Turkey and the trends on water policy trends, to present enlightening findings of analyses to the public opinion and decision-makers. In addition, the Programme aims to generate ideas involving different alternatives on water policies; to encourage and diversify the qualified works of competent researchers and intellectuals from different disciplines to offer efficient solutions; and to support the development of water research literature in Turkey.

Within this scope, ORSAM Water Research Programme also aims to facilitate visits of academicians, representatives of non-governmental organizations, bureaucrats, statesmen, strategists, journalists and businessmen, who are related to water studies from countries in the region, in Turkey; and to share their knowledge and views both with Turkish and also with world public opinion.

To this end, ORSAM Water Research Programme publishes current analyses, weekly water journals, reports and interviews on ORSAM Water website. This report includes interviews made in 2012 with academicians, specialists and executives from Turkey and world that are specialized on water. We extend our thanks to ORSAM Water Research Programme Specialists Dr. Tuğba Evrim MADEN and Dr. Seyfi KILIÇ, who made these interviews.

Hope to meet again in our new studies;

Hasan KANBOLAT
ORSAM Director

Tuğba Evrim Maden (Phd)

Tuğba Evrim Maden, who completed her undergraduate study at Hacettepe University Department of Hydrogeological Engineering, did her master's degree at Hacettepe University Hydropolitics and Strategic Research Center. In 2010, she received her Ph. D. from Ankara University, Institute of Social Sciences. She has been working in Center for Middle Eastern Strategic Studies (ORSAM) – Water Research Programme as “Hydropolitics Specialist” since 1 December 2010. Maden is a member of ISA (International Studies Association), IWA (International Water Association), International Association of Hydrological Sciences (IAHS) and a member of UİK (International Relations Council of Turkey).

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Seyfi Kılıç, who completed his undergraduate study at Gazi University Department of International Relations, did his master's degree at Hacettepe University Hydropolitics and Strategic Research Center. In 2010, he received his Ph. D. from Ankara University, Institute of Social Sciences. He is working in Center for Middle Eastern Strategic Studies (ORSAM) – Water Research Programme as “Hydropolitics Specialist”.

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By: Tuğba Evrim Maden (Phd)
Seyfi Kılıç (Phd)

ORSAM WATER INTERVIEWS 2012

CEYDA ALPAY: “BLACK SEA BOX PROJECT SUCCEEDED IN DRAWING ATTENTION TO ENVIRONMENTAL PROBLEMS IN BLACK SEA”

10 January 2012

ORSAM Water Research Program talked to Ceyda Alpay, who is the regional coordinator of the UNDP project entitled, “Every Drop Matters”, as well as the Black Sea Box project. Telling about the project, its consequences and the future projects, Alpay stated that Black Sea Box project, implemented in the countries with a coast on the Black Sea, is one of the sub-projects of the major project of UNDP entitled, “Every Drop Matters”; and she also indicated that the regional project attained a global dimension due to its success, and that its duration and spread expanded.

ORSAM: First of all, could you tell us about yourself?

Ceyda ALPAY: I have been working in the project of “Every Drop Matters”, under the umbrella of UNDP since 2009. Our project was launched as “Water Partnership Project”, in cooperation with United Nations Development Program (UNDP) and Coca-Cola Company, five years ago. And I have been the regional coordinator of this project for the last year. Bogachan Benli, on the other hand,



is the manager of our global project in Sweden. The project, which we firstly launched with Coca-Cola, started at regional level. The countries included in this project were respectively; Turkey, Russia, Ukraine, Kazakhstan, Armenia, Croatia and Romania. When the success of our project was proved, it attained a global dimension, thus we aimed at opening up to the world and we took steps accordingly. Right now, we are in the closing year of our regional project. As a matter of fact, the project was expected to end in late 2011. However, we extended this period until the end of 2012. We have several incomplete projects left in Russia, Ukraine and Kazakhstan. When they are completed, the project will be closed. Across Turkey, we have carried out projects such as the rainwater harvesting project in Beypazarı; drinking water project

in Saray; and “Black Sea Box” project on Black Sea.

ORSAM: What was the criteria of choosing the countries (Turkey, Russia, Ukraine, Kazakhstan, Armenia, Croatia and Romania) in this regional project?

Ceyda ALPAY: The partners of the project, which are UNDP RBEC (Regional Bureau of Europe and CIS) and Coca-Cola, decided on these countries, including the Eurasian and African group, in line with the requirements; and also by intersecting them such as to serve as a model.

ORSAM: Was any qualification, or characteristics related to climate and geography looked for?

Ceyda ALPAY: Not qualification, but of course problem was looked for. The projects were prepared considering the problems detected in the countries. For instance, if we had only implemented rainwater harvesting, we could not have done it in each country. However, we produced projects according to the climate, vegetation, geographical position of each country and also according to the requirements of that country. As we already work directly with the offices in those countries, the projects were decided in accordance with the demands coming from there.

ORSAM: Could you tell about the “Black Sea Box” project?

Ceyda ALPAY: “Black Sea Box” is an education box, which was prepared for teachers, and thus which aims at educating children on Black Sea. While this education kit was prepared, we cooperated with WWF, the Commission on the Black Sea, Organization of the Black Sea Economic Cooperation, and with the Ministry of National Education in Turkey.

Our objective is to draw attention to the problems in Black Sea, to figure out how to prevent them, and to inculcate these into children at the age early ages. In order to do so, we prepared “handbook” within the education kit for children. The handbooks include five titles. There are detailed explanations under each title. First of all, “hydrological and ecological characteristics of Black Sea, the importance of Black Sea, and the species in Black Sea” are explained. Then it is concluded by responding to questions such as; “Why should we protect Black Sea? What are the problems threatening Black Sea, and what can we do to find a solution?” This system depends on teachers’ reading the subjects themselves, synthesizing, and their making the subjects more clear for students to understand. There are approximately ten games at the end of each chapter. These are interactive games. Pages are handed out from the handbooks, and children learn something on Black Sea in each game. We followed the “training for trainers” method for this. We gathered teachers from all the cities, which have coast on Black Sea, and we explained them the Black Sea Education Box. Together, we played the games within the box. 1-2 teachers came from each school, and 1-2 boxes were given to each teacher. They use this box by turns in classes. The box was prepared for primary school students. This box includes game cards and two posters in addition to the handbook. We launched its Turkish pillar in 2009, and it will have been implemented across all the cities having coast on Black Sea by the end of this year. We reached approximately 950 teachers. In early 2011, we launched the “Black Sea Box” project in Russia and Ukraine. For the time being, the box has been translated from Turkish and English (to translate from languages to each others) to Russian and Ukrainian. Then, this project will be carried out in all the countries having coast on Black Sea, in Georgia and Bulgaria in particular.

ORSAM: What did you focus on while preparing the book? Was the marine pollution of Black Sea the main topic? Or, was the pollution of rivers, which flow into the Black Sea, also touched on?

Ceyda ALPAY: The river pollution was touched on in brief. In addition to this, various subjects ranging from the pollution of Black Sea by wastes, unconscious fishery, entrance of foreign species from outside, to ballast water coming from other seas are explained.

In 2012, Expo 2012 will be organized in Korea. There will be a session entitled, “*Ocean and Coast Best Practice Areas*”, in Expo 2012. They chose 12 best practice projects among the whole world projects, and the “Black Sea Box” is one of the projects chosen. A stand was reserved for us, and we took the opportunity to introduce “Black Sea Box” to the whole world. We are going to tell our project, make presentations, and make children play the games over there. Very high level of participation is expected. Especially young participants are expected.

ORSAM: In general, the beginning of projects is child-oriented. Are you in touch with organizations such as UNICEF, within the scope of your project?

Ceyda ALPAY: UNICEF helped us to reach the Ministry of National Education, as these two institutions are constantly in touch with one another.

ORSAM: You have said that the completion of the project was extended until 2012. Is 2012 the deadline? Or is there any possibility to further extend the period?

Ceyda ALPAY: The part in Turkey was completed as we finished the delivery. The deliv-

ery to Russia and Ukraine will have finished by the end of 2012. Then deliveries to Bulgaria and Georgia will begin.

ORSAM: What are your next projects?

Ceyda ALPAY: This was already one of the sub-projects of “Every Drops Matters”. We carry on as “Every Drops Matters” in 35 countries. The number of countries is expected to further increase. Our projects on water will continue depending on the individual characteristics of each countries.

ORSAM: Is there any Middle East country among these 35 countries?

Ceyda ALPAY: Yes, there is. We have projects in Lebanon, Jordan, Bahrein, Palestine and in the United Arab Emirates. Last year, we carried out a workshop in Istanbul, in order to inform that the project reached a global level. We invited authorities from the countries, we planned to include in the project, to the workshop. In return, we took their suggestions on projects that are required to be carried out in their countries. We evaluated certainly a project from each country, in line with demands.

ORSAM: Has any project been carried out on the utilization of fresh water resources in Black Sea?

Ceyda ALPAY: No.

ORSAM: There is no water shortage, but abundance of water. Perhaps, a project related to the water quality or water management could be carried out. But I guess it is not a priority issue for the time being.

Ceyda ALPAY: As a matter of fact, the countries having coasts on Black Sea are still in our area of interest. Right now, we rather carry

out “Every Drops Matters” projects. In other words, we carry out projects aiming at raising awareness, in which rather children and women could be included. We have had certain projects on the use of water resources. For example, we can include the rainwater harvesting project in Beypazarı within this scope. The new project from Turkey is rainwater harvesting project. We cooperate with the Aegean Foundation in this project.

ORSAM: What do you do when you sometimes encounter acid rain or unclean rainwater problem in rainwater harvesting projects? Does it go through a treatment process?

Ceyda ALPAY: In our project in Beypazarı, it is filtered through a very simple sand-gravel filter. The moment we establish the first pilot, the rainwater is already tested. If it fails, we do not implement it.

ORSAM: So, if it requires a major treatment, it is not implemented at all?

Ceyda ALPAY: Sure. Because, in such a case, it costs more expensive than the other systems.

ORSAM: Is there anything you would like to add?

Ceyda ALPAY: We would like our projects to be taken as example. Therefore, we will pay necessary attention in Expo 2012, and we believe that the project will create more impression after the Expo 2012.

ORSAM: Thank you for your time.

** This Interview was carried out by ORSAM Water Research Program Specialist Dr. Tuğba Evrim Maden in Ankara, on 10 January 2012.*

M. ARIF DEMİRER: “TURKEY’S BRACKISH WATER POTENTIAL MIGHT BE AN ALTERNATIVE RESOURCE”

17 February 2012

ORSAM Water Research Programme carried out an interview with Mehmet Arif Demirer, CEO of May-Su Inc. In the interview, the “Ekinambarı” project, in which “Brackish water treatment” technique was used and which also became a TÜBİTAK project, was handled. Mehmet Arif Demirer explained that desalinated brackish water can be used for irrigation, drinking and industrial purposes, and that waste water remaining from treatment could be turned to good account and no waste is left to environment. Stating that brackish water should be turned to account in a better way in Turkey, Demirer indicated that this potential might be an alternative resource for Turkey. M.Arif Demirer told that brackish water can be used for irrigation, drinking and industrial purposes. “Turkey’s brackish water potential might be an alternative resource,” Demirer said.

ORSAM: Mr. Demirer, could you please introduce yourself in brief?

Mehmet Arif Demirer: I graduated from Cambridge University in Mechanical Engineering in 1961. I received a master’s degree in the same subject in 1964, and I was given the title of professional engineer. The institutions I have worked in, and the projects I have carried out are respectively as follows;

1966-1972 Mersin Leyland Truck company. The last post; factory manager.

1972-1974 Contractor of a whole neighborhood composed of 30 dwellings in Saudi Arabia (infrastructure + furniture included). All materials of construction (iron/cement ex-



cluded, and furniture included) were exported from Turkey.

1975-1995 Turkey representative of the truck unit in the Austrian Steyr-Daimler-Puch company, construction of 55 thousand Steyr trucks in Adapazarı Agricultural Equipment plants, development of new models, coordination of after-sale technical services

1996-2011, research on membrane water desalination technologies with a family company called ALİNA co. ltd. established in 1986, and importation and marketing of Reverse Osmosis devices in various sizes. Appropriation of Ekinambarı salt (brackish) spring water from General Directorate of State Hydraulic Works (DSİ) on September 7th 2007-Appropriation: 400 lt/sec, 12,6 million ton/year

2007-2011 Co-founder and CEO of MAY-SU Inc.

2009-2011 Project coordinator of TÜBİTAK Research & Development Project numbered 7090218 on Ekinambarı spring water.

ORSAM: What is “Brackish Water”? Is that a common water resource in our country?

Mehmet Arif Demirer: In comparison with sea water, whose total dissolved solids (TDS) is 500 – 20 000 mg/lt, brackish water is less salty water. Brackish water is either extracted

from underground by drilling wells and by consuming energy, or as in Ekinambarı example, it is extracted from underground with its own energy.

The known brackish water Resources of Muğla provincial borders are as follows:

- Ekinambarı (Milas) Flow Rate: 4 000 lt/sec, TDS: 8 000 mg/lt, sea-water component
- Savran (Milas) Flow Rate: 4 000 lt/sec, TDS: 12 500 mg/lt, very high-level sulphate content % 35
- Akyaka (Muğla) Flow Rate: 7 000 lt/sec, TDS: 3 000 mg/lt
- Ören (Gökova) Flow Rate: 1 000 lt/sec, TDS: 5 000 mg/lt

All this water can be turned into drinking/domestic/irrigation water by consuming 2 kwhr/ton (ton of product water) at most. Except for investment amortization, total amount of cost-inputs including electricity is at the level of 1 TL/ton. And the investment is approximately 20 krş/ton in 12-month consumption. I believe that General Directorate of DSİ has an inventory work of brackish water across the country. Information on ground water can be learned from the General Directorate.

ORSAM: Can “brackish water” be used? What are the areas of use?

Mehmet Arif Demirer: Provided that it is desalinated, brackish water can be used as drinking/domestic/irrigation water. Discharge of waste water obtained after desalination process can pose a problem.

ORSAM: What is your project related to brackish water treatment? Where is it used?

Mehmet Arif Demirer: MAY-SU Inc. Project aims at contributing to national economy by desalinating Ekinambarı spring water.

ORSAM: Could you tell us about your co-operation with TÜBİTAK? In addition to this, what are the quality features of brackish water treatment in terms of hardness and ph?

Mehmet Arif Demirer: The TÜBİTAK Project numbered 7090218 was a Research & Development Project aiming at determining all technical features of Ekinambarı salt spring water, and also at conducting research on availability of remaining waste water in fish farming. The project began on 1.10.2009, and was submitted to TÜBİTAK on September 30th, 2011.

Let me inform you over the output.

A. Drinking-domestic-irrigation water, of which hardness is 2 degrees (French) and PH-value is 7,5. Its cost is the reflection of 1 TL/product water ton + Investment Financing per ton.

B. The remaining is the one that equals to waste TDS Black sea water (17 000 mg/lt). The PH-value of this water ranges from 8,0 to 8,5. The whole water was used in fish farming. Thus, ZERO WASTE target was reached at 100 %, the patent application was made, and it was officially registered.

C. In fish farming; pool water, which was polluted with fish droppings and unconsumed fish-feed in organic terms and thus which was discharged into the sea, was cleaned by mussels brought from Black Sea coasts of Bosphorus, and it was used at a minimum level. Thus, both water and energy were saved. Mussels reproduced and baby mussels survived. This situation showed that besides fish farming, mussel farming is also possible in the area.

D. Ekinambarı raw spring water, which flows away, will be homogeneously provided with oxygen (by using oxygen generator), and it will be given to neighbor pools, instead of extracting water from underground.

ORSAM: What are the environmental effects of brackish water treatment? How are the residuals from treatment processed?

Mehmet Arif Demirer: The residual waste water of each brackish water might not be used in another sector. For instance, the compound of brackish water extracted from neighboring village Savran contains high-level of sulphate. The sulphate content of residual waste water at the end of desalination process may not let using this water in fish farming.

Besides, as TDS value of Akyaka spring water is at a low level, after desalination of that water, only perch, which is not found in our country, can be farmed with the residual.

While evaluating brackish water, first of all a very detailed chemical analysis should be carried out, and features of both product water and waste water should be carefully detected.

As a result, it can be concluded that Turkey's brackish water potential might be an alternative resource. Therefore, this aforesaid potential deserves to be better assessed.

ORSAM: Could you compare brackish water with sea water? Could you make comparison of their treatments in financial and environmental terms?

Mehmet Arif Demirer: Brackish water (in Muğla) is the water, of which TDS values range from 3000 to 12 500 mg/lit. The salinity rates of sea water in our country show changes as follows:

Black Sea: 17 - 18 000 mg/lit, Energy: 2 kwhr/ton on average

Marmara: 24 000 mg/lit, Energy: 2,5 kwhr/ton
Aegean: 26 000 to 38 000 mg/lit, Energy: 2,5 to 3 kwhr/ton

Mediterranean 39 000 mg/lit, Energy: 3 kwhr/ton

Other cost elements (except for investment) are constant.

Investment:

Ekinambarı spring water: 1 750 ton/day. Reverse Osmosis device: 150 000 Euro + vat

Sea water: 1 750 ton/day Reverse Osmosis device: 500 000 Euro + vat

In general: Even though waste waters remaining as a result of desalination of brackish waters are not assessed in another sector as in the example of Ekinambarı; they could be discharged to sea without problem, as their TDS' would be lower than sea water.

On the other hand, deep see discharge should be made, as TDS of the remaining waste water obtained as a result of desalinization of sea water would be 60 000 mg/lit and higher. And this could be quite expensive.

ORSAM: Do you have some other projects?

Mehmet Arif Demirer: In case obstacles we have faced on commercialization of Ekinambarı spring water are overcome, our next project is the assessment of domestic wastes (garbage) by decomposing in Bodrum Peninsula. Especially organic wastes of restaurants and hotels can very easily be turned into organic fertilizer. The research was conducted.

In addition to this, we also have a big project of olive grove irrigation with product water. This project will be handled with Bornova Olive Production Research Institute.

ORSAM: Thank you for your time.

Mehmet Arif Demirer: You're welcome.

** This interview was carried out by ORSAM Water Research Programme Specialist Dr. Tuğba Evrim Maden, in ORSAM Ankara, on January 9th 2012.*

JACOB GRANIT: “WATER SHOULD NOT BE A CONSTRAINED TO ENERGY PRODUCTION”

22 February 2012

ORSAM Water Research Program Specialist Dr. Tuğba Evrim Maden talked to Mr. Jakob Granit, Programme Director at the Stockholm International Water Institute (SIWI) after the meeting entitled, “The Water-Energy-Security Nexus” that was organized by Friedrich Ebert Stiftung in Washington, on January 17th 2012. During the interview, Jakob Granit evaluated hydropower energy in the world and the effect of water shortage, which is foreseen to increase in the forthcoming period, on energy sources. “What we see is that we need to develop a much better understanding of the role of water in energy production so that water will not be a constrained to energy production” said Jakob Granit.

ORSAM: Mr. Granit, could you please introduce yourself in brief?

Jakob GRANIT: I am Geographer with a special interest in the political economy of transboundary water resources management and development. I am a Director at the Knowledge Services Department at the Stockholm International Water Institute (SIWI) with responsibility for advisory services and applied research in policy for public and private clients global. I have worked for the World Bank as Sr. Water Resources Management Specialist as a Cluster Team Leader for the multi-sector and multi-cultural World Bank Nile team providing advisory services, institutional building advice, and project design support to clients in East, Central and Southern Africa. Previously I worked for the Swedish International Development Cooperation (Sida) and managed a transboundary water resources initiative for the Southern Africa region.



ORSAM: Compared to water need of humanity, what is the dimension of electricity need? Jakob GRANIT:

Estimates suggest that about 1.6 billion people lack of access to modern electricity for cooking, lighting and heating. To meet the current service gaps for these customers and future demands from growing populations due to economic transformation of societies, global energy consumption is projected to grow by close to 49 percent by 2035. Much of this growth in energy demand will be in non-OECD countries. Water is required to produce energy for fuel production and power generation, and energy is needed to move and cleanwater through distribution and treatment systems. This link is usually referred to as the “water and energy nexus”.

ORSAM: What are the resources used for energy generation across the world?

Jakob GRANIT: Fossil fuels contribute 85% of the total global primary energy demand in 2008. Today only about 13 percent of the primary energy demand is met by renewable energy which in this context refers to hydro, bio, wind, solar, and ocean power. Hydropower

stands for 86 percent of the global renewable electric power production with significant potential especially in developing and emerging economies.

ORSAM: Could you assess the energy generation resources by comparing with each others in terms of developed countries, developing countries and underdeveloped countries?

Jakob GRANIT: Much of this growth in energy demand will be in non-OECD countries. There is a huge reliance on fossil fuels to meet primary energy demand and particularly the use of coal.

ORSAM: What does “access to modern electricity” come to mean?

Jakob GRANIT: Modern electricity means that households and industry has accessed to a reliable source of electricity for their needs such as cooking, lighting, manufacturing etc.

ORSAM: While energy is used in various fields such as pumping, carrying and treating water, energy is generated from water as well, could you explain this mutual relation a little?

Jakob GRANIT: A key example is the generation of hydropower from gravity flow of water.

ORSAM: You have talked about two kinds of water shortage; one of them is quantity shortage, and the other is water shortage stemming from technological and economic limitations, could you explain it to us?

Jakob GRANIT: Water scarcity can be because of political and economic limitations to manage and develop water resources for

productive uses. Many countries have access to water but do not have the institutional capacity nor the capacity to finance their investment needs on a market. This can be because the market is not functioning or constraints participation by water managers and suppliers exists. Well functioning water laws and regulations are necessary and compliance need to be monitored and followed up. From a technical point of view it can mean that countries do not have the adequate data and information available to assess their raw water resources or how the water resources contribute to build value in society.

ORSAM: What is the extent of water’s place in energy generation, and what is the tendency for the forthcoming years?

Jakob GRANIT: Electricity is the world’s fastest-growing form of energy consumption for end use purposes according to the IEO projected reference case 2007 – 2035. Consumption is estimated to increase 87% by 2035 (ibid). Electricity is used to meet an increasing portion of the world’s total energy demand and grows faster than liquid fuels, natural gas, and coal in all end-use sectors other than transportation. Coal will continue to be the fuel used most for electric power production at the global level according to baseline scenarios by the IEA. In 2007, coal-fired generation accounted for 42% of world electricity supply and in 2035 its share is predicted to increase marginally to 43%. One explanation for the development of coal fuelled generation is the attractiveness in cost compared to other sources. The need for water in all aspects of the power generation chain needs to be better understood at the local, national and regional level to see if water can be a constraint for electricity generation considering all other competing uses for water in an economy and to ensure the generation of ecosystem goods and services.

ORSAM: What is the situation when we evaluate hydropower energy generation in terms of the Middle East, Africa, Europe, the U.S., and Southern Asia?

Jakob GRANIT: Hydropower in U.S. and Europe has been developed to a large extent and currently there is limited investment in new hydropower schemes except perhaps for pump storage schemes in some power grids to take advantage of the ability to provide peak power in hybrid systems that has a major load of intermittent renewable power sources. In Africa and Southern Asia there is still large potential to develop hydropower. Lessons learned on how to develop hydropower to ensure that social and environmental values are not jeopardized exists and need to be implemented as these resources are further developed. There are opportunities to encourage power trade between countries as a way to transfer benefits from water resources development in one region to another using market systems or other mechanisms. In the Middle East Hydropower resources are not so significant anymore. However, some areas with major potential still exists primarily in transboundary basins which means that cooperation between riparian countries will be necessary.

ORSAM: It is foreseen that climate change will further affect arid regions, and will make humid regions more humid. In this respect, what will be the fate of current hydropower projects and forthcoming projects? Especially for the countries which base their energy security on hydropower...

Jakob GRANIT: In general IPCC demonstrate that regions that are dry will be drier

and regions that are wet will be wetter. To ensure energy security countries will have to diversify into different power generation sources and different sources of fuel. Cooperation across borders and allowing for power trade is another mechanisms and allow for a balancing of different sources of power. From a technical perspective detailed analysis of climate change at a local and sub-regional scale will have to be undertaken to assess if a hydropower scheme built long time back needs to be changed, the dam wall heightened, spill ways redesigned etc.

ORSAM: How is the water shortage to take place in forthcoming years going to affect other energy resources?

Jakob GRANIT: What we see is that we need to develop a much better understanding of the role of water in energy production at the local and regional scale so that water will not be a constrained to energy production. New power generation technologies that demand less water for e.g. cooling should be deployed. There are opportunities to encourage the use of power generation technologies that consume less water and to interconnect isolated grids and for example to allow for smart grid technology to allow for independent producers from a household to an industrial level to participate in the generation of sustainable energy.

ORSAM: Mr. Granit, thank you for taking your valuable time for us.

** This interview was carried out by ORSAM Water Research Programme researcher Dr. Tuğba Evrim Maden on January 17th 2012, in Washington DC.*

ANNA BACHMANN: “THE QUALITY AND THE QUANTITY ALSO THE MANAGEMENT OF WATER RESOURCES, THEY ARE ALL PROBLEMS IN SULEYMANIYAH”

15 May 2012

ORSAM Water Research Programme made an interview with Anna Bachmann, who is a program manager in Nature Iraq, about the studies of Nature Iraq and water issue in Iraq. In this interview, we talked to Anna Bachmann about water management in Iraq, marshland restoration and “The Key Biodiversity Areas Project” which is carried out by Nature Iraq.

ORSAM: First of all, can you please tell us about yourself briefly?

Anna BACHMANN: My name is Anna Bachmann. I am American. I have been living in Iraq since 2007 and working on Iraqi environmental issues since 2005. My first visit here was actually before the war in 2003. Subsequently, I came back to Iraq and began to work on environment-related issues. At which point, I met Dr. Azzam Alwash who is the current president of the Board of Nature Iraq, a Registered Iraqi Conservation Organization and I have been working for them since 2005. This is my seventh year.

ORSAM: So, you have been in Iraq for seven years?

Anna BACHMANN: Yes, I am in my seventh year. I did live in Iraq for six months in 2004, so I guess it is even a bit more.

ORSAM: What is your profession?

Anna BACHMANN: I have a master’s degree in environmental studies from The Evergreen State College in Washington State, in the U.S.,



which is kind of an interdisciplinary degree that is part environmental science and part environmental policy.

ORSAM: Can you give information about Nature Iraq? When was it founded?

Anna BACHMANN: Nature Iraq is a registered Iraqi conversation organization. Officially, we were formed at the end of 2004 but the organization existed under a different name as a project of the Iraq Foundation, which is a U.S.-based organization focused on building democracy in Iraq. At that time we were called the “Eden Again Project” of the Iraq Foundation. After the war in 2003 we were able to relocate into Baghdad with Iraq Foundation and subsequent to that we separated from Iraq Foundation and became a registered non-governmental organization in Iraq and also in 2007 we registered with the Kurdistan Regional Government as a regional NGO. We worked primarily, in the beginning, on marshland restoration in Southern Iraq. This is a big passion of Dr. Azzam Alwash, the CEO at that time, whose father was an irrigation engineer. He grew up essentially going out with his father to the marshes and he had very fond memories of that time.

When he heard that Saddam Regime had essentially nearly completely drained the marshes, he got very interested in seeing if

something could be done and approached Iraq Foundation to begin the project and that's how we started. So, when I first joined in 2005 our work was primarily focused around Southern Iraq and we had an office in Baghdad and a small presence in Chibaish in Southern Iraq, in the Central Marshes on Euphrates River. We expanded in 2007 when we opened our office here in Sulaimani that is when I moved to the country from Jordan, where I had been working and opened the northern Nature Iraq office.

It became actually our head office. We temporarily closed the Baghdad office because of very poor security time at that time and we relocated a lot of our staff here to Northern Iraq. We now actually have an office here that is still our head office and we have an office in Chibaish in the south and we have kind of a floating office with staff in Baghdad (we hope to open a physical office there soon). They work on mostly governmental relation issues with the Ministries of Environment, Water Resources etc.

One of our oldest projects started again in the marshes but has expanded country wide. It is called "The Key Biodiversity Areas Project", in which we survey every winter and every summer as many areas we could to determine if they were regionally and/or globally important for their biological diversity. This is a program that has actually occurred in Turkey already. Turkey has already identified its KBAs but Iraq has completed this work. So, we are in a process right now. Our first survey was in 2005 and now we are in a process of evaluating all of our data and creating a list of the KBAs for Iraq which we hope we will be the foundation of a future protected area network in Iraq.

In addition to that we started a new project this past year called the Iraq Upper Tigris

Waterkeeper. It affiliated with the international Waterkeeper Alliance, which started in the US, but now has over two hundred water keepers, river keepers, barkeepers or sound keepers all over the world, in almost all continents of the planet. We are the first water keeper project affiliated with them in the Middle East and we ultimately want to focus on the entire Euphrates-Tigris Basin in Iraq, but to start we are working within the upper Tigris River Basin in northern Iraq, which includes the Upper-Diyala, the Lesser Zab, the Greater Zab, the Khabour and the upper mainstream of Tigris River.

This is a large area and in fact could be covered by several water keepers. Water keepers are usually based in single basin. We hope to expand the project eventually, maybe even separate from Nature Iraq, forming a separate organization that would be focusing on river health and water quality... as well as flows and water quantity obviously making sure the river can survive in this age of climate change, drought and rampant dam building. It is really affecting people and the rivers.

So far it's a very successful project and we have done a lot of work, including river clean ups, some outreach and education. We are now doing a threat assessment of the Lesser Zab River under a grant from Rufford "Small Grants Fund" in the UK. There will be four seasonal surveys, trying to identify different threats and gauge their severity.

Usually water keeper projects are focused on taking polluters to court and one day it will be something we do but at this point, we are trying to just assess our river basins and do a lot of work on awareness and education about how to protect rivers and water quality.

Also, Nature Iraq is running small projects like the Eco-tourism project in which we have

developed a camp and a guesthouse in the marshes and also here in Northern Iraq at Piramagroon Mountain. We have just gotten a Darwin Initiative grant to do a major project with Royal Botanical Garden Edinburgh and Birdlife International, which is creating tools for biodiversity conservation to protected areas. This is focusing on Piramagroon Mountain, a 2600 meter tall mountain here in Sulaimani that we have determined is a site of high biological diversity. We also do a lot of work with the Iraq ministries, advocating for conservation, better use of water resources, and sustainable development. We've done a lot of work to help support Ministry of Environment meet their obligations under international environmental conventions such as the Convention for Biological Diversity and others.

ORSAM: What is the main problem in the Sulaimani region? We are focusing on major water problems, the quality, and the quantity, also the management of water resources.

Anna BACHMANN: I would say it is hard to separate them out, they are all problems here. We have definite issues with water quality. There is really no sewage treatment here. We have problems with water quality coming into the country as well as within the country. We have issues of declining water quantity. Most of the rivers in Iraq have declined in their flows. Quantity is definitely a concern and management is a big issue as well because we have the central authority in Baghdad and regional authority and they don't always see eye to eye.

On the top of this there are regional issues with Turkey, Syria, Iran and even Jordan. Iraq is now working on updating its plans for water resource management. Hopefully that plan will be made public so that people can

access it and have a say in its contents. All the riparian countries of the Tigris-Euphrates basin are putting up a lot of dams, without any regard to how these will affect people or the environment. With dams there are always losers - river itself is always a loser as it is quite literally being cut in half and most people living downstream are losers because they see reduced flows and reduced water quality. Upstream there are losers as often whole communities, agricultural lands, cultural and environmental resources are drowned out.

In an organization like Nature Iraq which is interested in conservation, we want the river to be healthy, everything along and in there river, such as the riparian forests and the fish in the river to be healthy. So, we have lots of concerns about dam construction and major water diversion project, taking water from one basin to another basin because it is basically not sustainable, not healthy for the ecosystem and it is not conducive of the good water quality and flows downstream or having adequate water in downstream.

Our organization started by working in southern Iraq and there are huge problems with lack of water, salinity buildup, and generally quite dismal water quality. We have to be telling everyone up-stream there is an issue here that they realistically and morally can't ignore. So, I cannot separate them out, they are equally important problems.

ORSAM: Do you have a project about water?

Anna BACHMANN: Well, it will be the Iraq Upper Tigris Water keeper Project that I've just described and any work we have done on the restoration of the Mesopotamian Marshlands of southern Iraq. Our work advocating for these Marshlands is a project essentially about and based on water.

ORSAM: In the project, for example, do you give some education to the children about water protection?

Anna BACHMANN: Yes, we just actually finished a small film called “The Water keeper”. It was made using two characters wearing masks, Naza and Zaza, two children who discovered the problems on the river, were affected by them, and tried to do something about it. It is a 26-minute film and we completed it only two weeks ago. We showed it to the kids in local schools and community groups and used the film just to start a dialogue with them about the rivers in their area. I think we can get the link with to the film. We are also doing a Green Music & Arts Festival in Sulaimani for 20 April (associated with Earth Day) to combine the arts with an environmental message. We need to continue to raise awareness and out of that we are also looking to raise enough money to develop a campaign of public service announcements, TV radio and print ads that are focused on the environment. They will be primarily focused on raising awareness about water protection. Because we do work on biodiversity, we do a lot of stuff with birds. Right now, some of the staff is doing a wild goat survey. There will be some outreach related to wild goat conservation because we have a lot of hunting that goes on here. In addition, we piloted the first Environmental Education program in the marshes in 2011 and hope to find the funding to continue to support that work. We have plenty of ideas for this work if we can find the support for it.

ORSAM: Can you inform us about the latest information about the marshlands in Southern Iraq?

Anna BACHMANN: The best person to ask this is Dr. Azzam Alwash, president of Nature Iraq’s board. He’s made this issue a major fo-

cus of his life’s work. We usually use the 1970’s as a baseline for the marshlands in their heyday, a lot of dam construction began to affect them around this point but they were still largely untouched. Because of the seasonality of when water would arrive to the marshes, they are pulsed and grew larger in the spring and their estimated size at this time was from 15.000 and 20.000 square kilometers.

Of course in the mid-1990s all that changed dramatically not just due to dams but because the Saddam Regime began an active campaign to drain the marshlands and persecute its inhabitants. Today, since the reflooding that took place after the war in 2003, we use the 1970s as the baseline to judge the now reflooded marshlands and, I think, for a short period after the war, they achieved about seventy-five percent of that former footprint. I would not say this area was restored but simply reflooded, as the system is radically changed and there are issues of lack of flow-through and salinity build up that need to be examined.

But currently I think we are done below fifty percent of the original 1970’s footprint because of all the challenges we face upstream. We know that if Iraq actively manages the water it has better, we could potentially get to close to seventy percent of the former marshland footprint reflooded. But to get to hundred percent we have to have agreements with our neighbors upstream. Iran has build a major embankment through the trans-boundary Hawizeh marshes effectively stopping water that formerly entered these important wetlands from Iran. These marshlands were recently listed as Iraq’s first Ramsar Wetlands of International Importance as they were the only marshlands in the south that were never completely drained by the Saddam Regime in

the 1990s (largely because Saddam couldn't stop the water coming from Iran). But Iran has dealt them a heavy blow today. We also need equitable water sharing and water quality from Turkey and Syria.

And it is just not the issue of amount of the water but also the timing of the water. Because historically, before the dams, winter storms would fill the mountains of Turkey, Iran, and northern Iraq with snow and this would melt into the spring floods that until many of dams put an end to this would pulse into the Mesopotamian Marshlands (our last major spring flood was in the 1960s). Those spring floods push out of the salty water that had accumulated over the dry hot summers and nature had perfect time this for the coming of the birds the breed and the fish to spawn in the marshlands.

Life had evolved this way over a millennia and it was an incredibly biologically diverse and bountiful ecosystem. So you have a situation now where not only do we have less water, but the water comes at the wrong time, it does not come in the spring, but is spread out through the year based on human management decisions that don't take ecological needs into account. So to truly restore the marshlands even with the water we have, we need to re-establish not just adequate flows, clean water but the timing of when this all happens as well.

Given the heavily modified upstream environment this will require a complex and highly managed system. So as you can see we have a lot of issues about water and it is not just a simple issue of quantity; it is also an issue of quality and an issue of proper management. There really has to be an integration of these three issues for us all to get what we need as well as have marshland restoration in Southern Iraq.

A couple of years back, from 2008 to 2009; we had almost no water in the marshlands. The communities there really suffered when the drought came, it was really awful year for them. We are seeing less rain in northern Iraq, even in 2012 we still see less than the 10 year average. Overall the basins of the Tigris and Euphrates may have had an average year but with dams and water diversions, the water wasn't getting to the marshlands. We can have a debate about is it dams or is it climate change, but in fact it is likely both. These factors came together and that was a real brutal year for the people in the South, people who live in the marshes are the poor in Iraq. They are so natural resource dependent and these issues have immediate consequences for their livelihood.

I should also mention in 2006 we developed the "Master Plan for Integrated Water Resource Management in the Marshland Areas" and presented several scenarios for how Iraq could manage the water better. I think that the management plan was largely adopted by the Ministry of Water Resources and some of the water control structures we advised they build to manage water better have been completed. We also gathered a great deal of socio-economic information. The master plan is a series of eight books and the book on water resources is quite good.

ORSAM: Do you have any project related to how US Invasion in Iraq and the war affected the water and the ecosystem?

Anna BACHMANN: This is interesting because when I came to Iraq, I was interested in the depleted uranium issues caused by the U.S. Military (Depleted uranium is a low-level radioactive waste product of the uranium refining that is extremely hard and has been used by western Militaries in projectile points, which were used extensively in wars

in Iraq in 1991 and 2003). You should also ask Dr. Alwash about this we had two differing opinions about it. In my opinion, it is one thing, if a country pollutes itself and another thing if it spreads its own pollution on another country. That is really reprehensible. I would say for that reason alone, the issue of the depleted uranium deserves some discussion and some investigation. There is certainly a lot of anecdotal information that says that depleted uranium is a real problem for Iraq. For example in Fallujah, now there is evidence that they have both high levels of cancer but also high rates of birth deformities that may have a radiogenic source. But Dr. Alwash would say there is so much pollution in Iraq that has been going on for decades how can you really separate that out as a cause from what the Coalition forces have done? Nearly all major towns and cities in Iraq, as well as those in many upstream countries dump their wastes into the waters of the Tigris & Euphrates basin without treatment. I see his point of view as well.

When I was in Baghdad in 2004, the area of the city that the Coalition forces controlled was called the “Green Zone”. It contained Saddam’s former central palace and all of these government offices were placed there. There is a part of the Tigris River bordering this area that no one is allowed to pass through during Saddam’s reign. You couldn’t take a boat from northern Baghdad to southern Baghdad on this river. To me, it was rather symbolic. When the Americans came in, they kept the same policy for the Green Zone and the river. Baghdadians are not allowed to use the river in this area. A couple of fisherman can go but nobody really can go from north to south on the river.

Also along that river, but just outside of the security walls of the Green Zone were a

dumping area for the Zone. Image a garbage dump in the center of a major city right along a river? You would not see this kind of thing anywhere except in Baghdad. But on the other hand, as a result of the Americans’ influence, the Iraq Ministry of Environment, which didn’t exist under Saddam, was also created.

ORSAM: Also was the Ministry of Water Resources was created by the government after the war?

Anna BACHMANN: I believe before the war this was just known as the Ministry of Irrigation. But Nature Iraq does not focus on what the Americans did or did not to. Dr. Alwash has an attitude that we have a lot of problems regardless of what Americans did or did not do. We have a much longer standing issues in this country. If you want to talk about environmental catastrophes, drainage of the marshes is number one. Saddam was gassing villages and nearly every single village in northern Iraq was either bombed or gassed or both. I think, you heard about Halabja, which is the most public case that got a lot of media attention but there were a lot of towns and villages that face the same treatment.

But for me, where I lived in USA, I am very close to a naval magazine installation, where they store depleted uranium munitions. They actually destroyed it there. When I came to Iraq originally, I came with a peace organization and I participated in a protest at that military base and focused on the issue of depleted uranium. Photo albums are full of children that born with terrible defects. I was very much interested in that issue.

ORSAM: Is there any effect in USA near the town where depleted uranium was stored?

Anna BACHMANN: It is certainly a topic of discussions, yes.

ORSAM: Is there any birth with deformities?

Anna BACHMANN: I'm not aware of this. Mostly when the issue of depleted uranium is brought up in regard of health effects, it is about soldiers and their exposure. Military bases have a lot of rules and regulations and they have a lot of control over health. I think fisherman might have concern about it. I am not really following the issue anymore because of my local work in here in Iraq now. But I know for example that there is an epidemiologist in New York, he had a very interesting project in which he collected babies' teeth from all over Iraq and also Jordan and all around. Apparently radioactive material can be deposited by the body in teeth. He wanted to do this project to examine how much and what types of radioactive material could be detected in these teeth but as far as I know he has not found the funding to complete the project. It is very hard to find support for such research.

We humans are always experimenting on ourselves. I would say the bigger problem

even than depleted uranium is pharmaceutical chemicals. We all take drugs, antibiotic, use detergents, shampoos, cosmetics ... and these all go down the drain and into the water and we have no idea what the effects of this chemical soup is. My father says that the local drinking water in my hometown has more antibiotic in it than a pharmacy and I should come back and work on this issue. All these pharmaceutical chemicals, but also agricultural chemicals like pesticides or industrial wastes end up in our water. They can affect embryo development, sexual development. There is a lake in Florida with alligators and because of the effects of endocrine disrupting chemicals that we have placed in these waters, male alligators showed some features of female alligators. We do these experiments on ourselves.

ORSAM: Thank you for your time.

** This interview was carried out by ORSAM Water Research Programme researchers Dr. Tuğba Evrim Maden and Dr.Seyfi Kılıç on February 7th 2012, in Suleymaniya.*

PROF. DR. HÜSEYİN GÖKÇEKUŞ:
 “TRNC DRINKING WATER SUPPLY
 PROJECT WILL BE THE PROJECT OF
 THE CENTURY”

28 March 2012

On March 1st 2012, ORSAM Water Research Program Specialist Dr. Tuğba Evrim Maden talked to Prof. Dr. Hüseyin Gökçekuş, Vice-Rector at Near East University and General Coordinator for Water in TRNC Ministry of Agriculture and Natural Resources, on TRNC’s water resources, water problems, the process of “TRNC Drinking Water Supply Project” which is an important project as a solution for TRNC’s drinking water problem, and on the importance of the project for the East Mediterranean.

ORSAM: Could you introduce yourself in brief?

Prof. Dr. Hüseyin GÖKÇEKUŞ: I was born on 23 December 1960 in Nicosia, Cyprus. I completed my elementary and secondary education in Cyprus. I graduated from the Department of Geological Engineering in the Faculty of Sciences at Ankara University in 1982. The same year, I started my M.Sc. Studies on hydrogeology at the Middle East Technical University (METU) under the supervision of Prof. Dr. Vedat Doyuran, and completed my studies after the submission of my M.Sc. thesis entitled “Hydrogeology of Western Konya Plain and Interpretation of Groundwater Level Fluctuation”. I started my academic career as a research assistant at Middle East Technical University on December 1983. I completed my Ph.D. Studies in the Department of Hydrogeology in 1990, following the preparation of my thesis paper on “Hydrogeological and Hydrogeochemical Evaluation of the Güzelyurt Groundwater Basin-TRNC” again under the supervision of Prof. Dr. Vedat Doyuran.



Following the completion of my Ph.D. studies, I left METU, where I had conducted my studies and worked as a research assistant for 7 years, and returned to the Turkish Republic of Northern Cyprus (TRNC) on December 1990. Since the completion of my military service on March 1992 (for 20 years now), I have been working as a lecturer at the Near East University (NEU). I have been working both as the Chairman of the Department of Civil Engineering and as the Vice Rector.

I have already published 80 articles that focus on water problems in particular, as well as the environment, earthquakes, tourism and education in the country: most of them being in English, and also conducted the editorial position of many books. I have carried out over 120 presentations in various countries such as Turkey, the TRNC in particular, as well as in Southern Cyprus, Sweden, France, Greece, the United States of America, Italy, Austria, Morocco, Azerbaijan, the United Kingdom, Norway, Kyrgyzstan, Indonesia, Russia and Brazil. Moreover, I have had over 50 interviews with both national and international press. And I have also had several articles published in both Turkish and English.

I was elected for membership of the Higher Education Planning, Evaluation, Accreditation and Coordination Council (YÖDAK) by the Turkish Republic of Northern Cyprus and

the Assembly of the Republic on 25 October 2010, and appointed for 4 years as a council member on behalf of the National Parliament. Lastly, I was appointed as General Coordinator for Water by the Turkish Republic of Northern Cyprus (TRNC) Ministry of Agriculture and Natural Resources on December 26th 2011, to participate in relevant works related to bringing water from Turkey, to determine policies on water sector, to guide the design and formation of water management in our country, and to establish required communication in order to meet other goals related to the water sector. While I have been striving to give the final form to the “Water Management Law” along with all the shareholders in TRNC, specialists from Turkey and EU officials on water; on the other hand, I have been conducting Integrated Water Resources Management works by considering 75 million cubic meters of water to be carried from Turkey in 2014, and meanwhile, I have been working on establishing a new sustainable water policy in TRNC.

What is the water potential of the TRNC? How is the water richness of TRNC in terms of water quantity and quality per capita?

Prof. Dr. Hüseyin GÖKÇEKUŞ: It is not possible to give a certain figure about the water potential of TRNC. Because there is no any healthy data. However, we can easily suggest that TRNC is country “poor in water”. Because we can easily say that the quantity of water per capita per year is way under 1000 cubic meters, despite the fact that we do not have certain figures. This is the quantity aspect of the issue. When examining the current water resources in TRNC in terms of the water quality as well, it cannot be said that the water quality of water both used as drinking water and also for irrigation is not the same in every region. Substantial salinization took place with the effect of sea-water intrusion

especially depending on the extreme water drawdowns from the coastal aquifers. The other environmental factors impairing the quality of our current water resources can be listed as follows: (litters left on dry stream beds and pond areas especially during dry spells), cesspool wells on aquifer areas, artificial fertilizers largely used in agricultural areas, and chemicals used in agricultural protection. In addition to this, abundance of fusible minerals taking place in the geological formations plays role in increasing the hardness of water especially around the pond areas.

ORSAM: What are the water problems taking place in TRNC? Is it possible to briefly list the reasons of these problems?

Prof. Dr. Hüseyin GÖKÇEKUŞ: We have been encountering both water shortage and water quality problem in our country because of drought in TRNC considerably taking place with the effect of climate change especially for the last 40 years, notable increase in population, environmental pollution and waste water as a result of the development of certain sectors, the pollution of current surface and ground waters which are already scarce due to the lack of infrastructure, over salinization of ground waters in coastal regions depending on extreme drawdowns, uncontrollable use of artificial fertilizers in agricultural areas, and large amount of pesticides used in agricultural protection.

When analyzing the precipitation and temperature values of the last 100 years in TRNC, it is observed that there has been a constant increase in temperature values almost for all months within a year. On the other hand, when examining the precipitation values of the last 96 years, we have been observing a decline at the rate of 25.9%. This situation shows that the current precipitation has decreased at the rate of one quarter for the last century.

In addition to water shortage and water quality problem taking place in our country to a great extent, another problem as important as the others is the water management problem. In addition to both insufficiency and lack of quality of irrigation water used in agricultural areas and also the lack of quality and quantity of water provided as drinking-potable water, especially in recent years, not only makes water undrinkable, but also it makes it impossible to take a shower with quality water and also gives severe damage to dishwashers and washing machines we use for cleaning purpose at home. We cannot, either, say that we healthily manage our water resources, which we have been encountering major problems with in terms of quality and quantity with each passing day. In addition to lack of a serious water policy in the country, the lack of sustainable water management plan has also caused to an increasing rise of difference between water supply and demand equilibrium in time. To sum up, an understanding of water management far from integrated water resources management carried the water shortage and water quality problem in the country to the highest level.

The reasons of the water problem in TRNC are briefly listed as follows:

- 1- The fact that substantially, almost more than 70% of current water resources are uncontrollably used for agricultural purposes,
- 2- Persistence on growing crops with traditional methods instead of changing product range by insisting on wrong choice of product. Problems stemming from not fulfilling the principle of obtaining the maximum yield with minimum amount of water in most appropriate soil with our water resources already in shortage. As a result, we can suggest that, product quality and product productivity in agricultural products also decreased to

a great extent depending on decrease in water quality, and besides, we can also assert that the profit margin is quite low or no profit is made at all depending on the rise in agricultural input cost; and rise in price of electricity used during water supply, and rise in prices of other product inputs,

- 3- Problems stemming from uncontrollable overconsumption of water by using drinking-potable water provided by municipalities for purposes other than drinking and domestic use such as, for instance, car wash, garden cleaning and garden irrigation; and on the other hand, problems stemming from the lack of infrastructure that will make it possible for these waters used at home to be recycled,

- 4- The fact that domestic waste water cannot be treated at a desired level and used sufficiently for other purposes across the country yet,

- 5- The fact that majority of the society are not fully aware of the current water problem across the country. In addition to the insufficiency of laws in effect, the weakness shown in lack of deterrent force or in enforcing law, when these laws are not respected. Besides, insufficiency in explaining the importance of water and that one day we can run out of water in case this valuable meta is not used economically, to large segments of society; in other words, lack of raising necessary awareness. The fact that duties of individuals and the state to be able to overcome this major problem cannot not explicitly stated. For example, on replacing current infrastructure in households with new instruments that allow using less amount of water and increasing economical use of water to a great extent; both lack of raising awareness of individuals who will make this change, and also the fact that the State does not provide individuals with additional opportunity (providing long-

term and low-interest loans) to encourage people to take those steps,

6- While carrying on building new shafts (with state permits) to increase current salinity despite substantial salinization of coastal aquifers in face of extreme ground water drawdown brings salinization to the highest level; problems stemming from substantial decrease of current quantity of water in aquifers or aquifers' drying out from time to time because of the exigence to meet almost all needs from ground waters especially during long-term dry spells,

7- Besides major damages caused by floods taking place in 1-2 years of rainfall after the long term drought (even though a rare situation), problems stemming from the fact that this substantial amount of water cannot be sufficiently stored in surface during rainy winter months or stemming from the fact that waters rapidly flow into the sea as measures are not taken and scientific studies are not carried out in a way that will nourish underground,

8- Chaotic situation caused by lack of communication, coordination and cooperation among concerned shareholders on water management stemming from unfinished Contemporary Water Management Law which is still worked on,

9- Problems stemming from insufficiency of scientific studies required to be carried out in order to healthily detect water policies of the country for the future, and also stemming from the lack of correct data to support these studies,

10- Soil classification studies launched in the country to be able to determine the most appropriate areas to be engaged in irrigated farming were completed. Right now, studies

for the selection of the most suitable plant species to be produced on soils, whose qualities are detected, have been conducted by considering the distribution of soils, whose classifications are completed, in TRNC and current water resources. Problems stemming from not beginning yet the market analysis studies planned to be handled at final stage. The market analysis studies should be jointly handled and evaluated during these days while still working on determination of plant species, not as the 3rd Stage. Otherwise, all studies and investments will go for nothing even in case the best product without any market that we cannot sell is obtained.

ORSAM: Can you briefly tell us about the water resources management in TRNC?

Prof. Dr. Hüseyin GÖKÇEKUŞ: Water management problem comes first among the major water problems. Preparations of "Water Management Law" on the management of water resources in TRNC still continue. With the water management law to be introduced, many laws in force since the British colonial period (prepared in line with technologies and utilization strategies of that period) will be repealed and they will be gathered under aforesaid single law. Department of Mining and Geology deals with works on ground waters; while Water Department, on surface waters. The municipalities, on the other hand, are responsible for the distribution of water provided by Water Department. The district governor is responsible for the management of irrigation water, and is the Head of Regional Water Committee. Within the structure of Regional Water Committee is found Water Department, Department of Mining and Geology, Department of Agriculture and district governorate representative. What is underlined here is the issue on the harmonization of water management law, prepared meticulously, with "EU laws and directives on water". We meticulously focus on this issue.

ORSAM: How is the distribution and quality of ground waters in TRNC? Are there any projects carried out on salinated aquifers as a result of salt-water intrusion?

Prof. Dr. Hüseyin GÖKÇEKUŞ: On TRNC-Aquifer Map that our Department of Mining and Geology prepared, 11 aquifers draw the attention. These are listed respectively as follows: Güzelyurt (Morphou) Aquifer; Yeşilirmak Aquifer; the Beşparmak Mountains Karst Aquifers; Girne (Kyrenia) Coastal Aquifer; Karpaz Region Aquifers; Yeşilköy Aquifer; Yedikonuk-Büyükkonuk Aquifer; Dipkarpaz Aquifer; Akdeniz-Koruçam (Agia Irini/Kormakiti) Aquifer; Orta (Central) Mesaroria Aquifer; East Mesaroria Aquifer; and Southeastern Mesaroria Aquifer.

The aquifers in TRNC are generally composed of recrystallized dolomitic limestones with alluvial, calcarenite, calcareous sandstone, karstic characteristics; and of gypsum formations.

Güzelyurt Aquifer, which is the biggest aquifer of the island, is composed of units with alluvial characteristics. As a result of extreme water drawdowns depending on water need especially because of drought, there are kilometers of sea-water intrusion from coastline inwards throughout the stream beds on aquifer and composed of relatively loose material compared to the aquifer structure. We see that the conductivity values of samples taken from salinated shafts in alluvions, normally having conductivity value of 600-1200 ohm/cm, exceed 7000 ohm/cm.

The Beşparmak Mountains Aquifer, which is composed of karstic limestones and dolomitic limestones and which has the best quality waters, has the conductivity value of 500-880 ohm/cm.

Another aquifer needed to be focused on is gypsum aquifers, whose value of conductivity with the content of CaSO_4 reach up to 9000 ohm/cm and which contain oversalinated and hard water with limited area of use. The point which is needed to be highlighted about all aquifers is the fact that substantial declines have been recorded in ground water levels of all aquifers without any exception across the country resulting from insufficiency in replacing groundwater drawdown from underground with rainfalls as a result of drought taken place especially from early 1970's. In fact, certain small aquifers dry out from time to time in summer months.

Touching on the projects carried out for the improvement of salinated coastal aquifers, we can mention the Plateau Irrigation Project in Güzelyurt district, and partially the Güzelyurt Derivation Project. However, neither of the projects could be effective in the region because of the fact that the Güneşköy Pond planned to be built within the scope of Güzelyurt Derivation Project was not carried out, that waters derived from Lefke and Çamlıköy regulators carried out within the scope of project into the Güzelyurt Pond reached sea by overflowing in a short time as a result of the insufficiency of the pond capacity; and besides deficiencies and faults in implementation phase of the plateau irrigation project, on the contrary, these two projects led to increasing rise of salinization in the region in process of time.

ORSAM: What is the situation in the whole island in terms of water resources?

Prof. Dr. Hüseyin GÖKÇEKUŞ: With its 9251 km² area, Cyprus is the third largest island in Mediterranean; and Turkish population lives in the northern part of the island with 3355 km² area. The length between the Island's east and west is 225 kilometers; and

the distance between northern and southern regions is 96.5 kilometers. When analyzing the island in geological and geomorphological aspects, we see that it is generally composed of 3 parts. In the northern part of the island is found Girne Beşparmak Mountains in east-west direction, and in the south-west is located Trodos Mountains, and Mesaoria Plain is located in between the two mountain ranges. While in the South, Olympos Hill with 1951 meters in the summit of Trodos Mountains is the highest point of the island; Selvili Hill in Beşparmak Mountains is 1023 meters high.

As high hills and highlands are mainly located in South Cyprus, the districts rich in rainfalls, the south receive more rainfall in parallel with the topography. As a matter of fact, while the annual rainfall is 500-550 mm in very limited areas in Girne Beşparmak Mountains; almost the whole Trodos Mountains located in south receive precipitation around 500 mm and more, and these precipitation values go beyond 1000 mm in the mountaintop and these values can reach 1100 mm from time to time.

The majority of Mesaoria Plain, the region with minimum amount of precipitation, is situated in Turkish part. While the precipitation values in the whole aforesaid region range from 300 to 350 mm, less than 300 mm of precipitation falls almost in the whole north-west region of Nicosia and Güzelyurt district.

That being the case, 92% of water used for drinking-service, agricultural, industrial and purposes in TRNC are provided from ground waters, and 5% of the rest is provided from surface waters (ponds) and 3% from sea water after treatment. The studies show that the total amount of water used in TRNC is 100-110 million cubic meters, and while 30-35 million cubic meters of this amount is used for drinking irrigation purposes, 50-55 million cubic meters is used for irrigation, 10 million cu-

bic meters is discharged into the sea through ground water flow.

The evaluation on South Cyprus was carried out in the light of a research conducted in 2000. Within this scope, 182.4 million cubic meters (69%) of water is used for agricultural purpose, 67.5 million cubic meters (25%) for drinking-service purposes, 3.5 million cubic meters (1%) of water for industrial purpose, and 12.5 million cubic meters (5%) for environmental purposes; thus, 265.9 million cubic meters of water is used in total. Again based on the same study, it is stated that 101.5 million cubic meters (38%) of total 265.9 million cubic meters of water used within 2000 is obtained from ponds; 127.4 million cubic meters (47.9%) from ground waters, 3.5 million cubic meters (1.3%) from springs, and 33.5 million cubic meters (12.6%) from sea water. In the light of these values, it is indicated that 82 million cubic meters (43%) of 182.4 million cubic meters of water used for agricultural purposes is obtained from ponds, and 100.4 million cubic meters (57%) from ground waters. Similarly, 14.5 million cubic meters (21.6%) of drinking-service water is used by treating water from ponds, 16 million cubic meters (23.1%) from ground waters, 3.5 million cubic meters (5.2%) from springs and 33.5 million cubic meters (50%) from sea water. It is suggested that the whole amount of 3.5 million cubic meters of water used for industrial purpose is provided from ground waters, 5 million cubic meters (42%) of water used for environmental purpose is obtained from ponds and 7.5 million cubic meters (58%) from ground waters.

This study carried out in 2000 also developed projections for 2005, 2010 and 2020; and it was stated that 182.4 million cubic meters, calculated to be the water need for agricultural purpose for year 2000, would be at the same level respectively for 2005, 2010 and

2020. On the other hand, it was foreseen that the need of 67.5 million cubic meters that is the amount of water used for drinking and service purposes in 2000 would increase up to 76.4 million cubic meters in 2005, 86.1 million cubic meters in 2010, and 104.3 million cubic meters in 2020. Here, these figures were estimated by considering the possible increases in amount of tourist besides the population growth. Similarly, while water used for industrial purposes is 3.5 million cubic meters; this figure was respectively foreseen to be 5,6 and 7 million cubic meters in 2020. Finally, the amount of water of 12.5 million cubic meters used for environmental purposes is predicted to respectively reach 14 million cubic meters, 16 million cubic meters and 20 million cubic meters.

As can be seen, while it is foreseen to keep constant the amount of water to be used for agricultural purpose in South Cyprus in the face of drought taking place in the Island; it is highlighted that a natural increase in amount of water to be used in all sectors except for agriculture is inevitable. As a matter of fact, the total amount of water need which is calculated to be 265.9 million cubic meters for the year 2000 is predicted to be 277.8 million cubic meters in 2005, 290.5 million cubic meters in 2010, and 313.7 million cubic meters in 2020.

Another point needed to be focused on is the fact that, when pond capacities are compared, the pond capacity in South Cyprus (approximately 330 million cubic meters) is ten times more than the pond capacity in TRNC (33 million cubic meters). Although the occupancy rates in both sides are beyond 80% as of this year, this rate can remain in 10-15% values during dry years. The water problem of the island in south reaches the highest level in such cases. Therefore, considering the current and future dry years, as well as the years the surface waters could be used at minimum

level, solutions have been sought to increase alternative water resources since 1996-97. To this end, the sea-water treatment was focused on in the south, in the process of years. While the amount of treated water obtained from sea in 2000 was 33 million cubic meters, today the amount of treated water obtained from plants that can meet 50% of the water need of tourists in particular in south goes beyond 50 million cubic meters. And this situation comes to mean that sea-water treatment has been on increase at the rate of some 100% for the last 10 years in south. In recent years, domestic waste water was also started to used for agricultural purposes after treatment. And we believe that the solution for the current water problem in northern part of the island is the project that will supply TRNC with 75 million cubic meters of water to be transferred through the pipeline from Turkey.

ORSAM: What is the situation in Güzelyurt aquifer, the most important aquifer of the island?

Prof. Dr. Hüseyin GÖKÇEKUŞ: As you have also indicated, Güzelyurt Aquifer is the largest aquifer of the Island with its area of 280 square kilometer, of which 180 square kilometers is situated in Turkish side, and of which 100 square kilometer is located in south. The 70-80 % of the TRNC agriculture is engaged in productive soils on Güzelyurt aquifer as the top quality soils (the fact that more than 50% of current soils is 1st and 2nd class soil) of TRNC in terms of agriculture is found in this district. Almost the total amount of water needed for these fertile soils, where every kind of agriculture is done, have been strived to be constantly provided from underground especially during dry spells. Besides, since 1950's, Nicosia and Famagusta have been provided with drinking water by building plenty of shafts in the region situated between Kumköy-Gaziveran, on Güzelyurt aquifer. In line with the water need caused by the wid-

ening agricultural fields over the years, water has been constantly drawn from the aquifer, and also the 24 hours non-stop operation of drinking water shafts has led to the decline of ground water levels in aquifer to -50 meters. Kilometers of salinization effect has been seen in the coastal part of the aquifer, as more amount of water is drawn than the amount of water which is drained into underground as a result of annual rainfalls. Despite the fact that electricity conductivity value from the current drinking water shafts reached 7000 ohm/cm, water is still pumped as it is needed.

ORSAM: Which projects have been produced for the solution of water problem in TRNC, so far?

Prof. Dr. Hüseyin GÖKÇEKUŞ: - The number of ponds constructed for irrigation purpose and for nourishing ground water has reached 41

- Even if incomplete, the Güzelyurt Derivation Channel Project has been partially constructed.
- The utilization of modern irrigation methods has been completed to a great extent (The rate of Citrus Irrigated Through Drip Irrigation Method reached 98%).
- The prices of drinking water were revised and more realistic prices were determined.
- The amount of water provided for consumers was redetermined in accordance with the realistic water quantity needed.
- Works on the renovation of water distribution networks and reduction of water loss in network were speeded up, and especially in recent years, various municipalities have renovated kilometers of water supply networks in their own districts.
- Due to the drought taking place during the driest spells, in long and dry summer months, it was strived to carry water from Turkey through balloons in late 1990's, but

then this project was given up when the desired productivity was not obtained because of technical problems.

- Partial and regional solutions were sought by ignoring the requirement to solve the problem by handling water management and water problems in integration across the country, and accordingly, a project to eliminate salinization of shafts in the Plateau district, in a district close to the coastline on Güzelyurt Plain, was desired to be carried out; but the project failed. When the project was completed, the salinization in the region doubled/tripled instead of reduction.

ORSAM: On March 7th 2011, the foundations of Alaköprü Dam to be built on Dragon Stream, one of the most important pillars of the “TRNC Drinking Water Supply Project”, were laid. What is the importance of this project for East Mediterranean, world, and for TRNC in particular?

Prof. Dr. Hüseyin GÖKÇEKUŞ: Yes. This mega project that we call “the project of the century”, the project of transferring water through the pipeline from Turkey, the project that will be the solution for the water problem taking place in TRNC has been realized step by step with the foundation laid 11 months ago. Prime Minister Recep Tayyip Erdoğan has had the chance to realize this project, which has always been on the agenda of former governments of the Turkish Republic since 1960's. Turning back to 1960's, it has been 50 years since the statements of then-President Makarios, “I do not let the Island to be connected to Turkey even either through pipeline or through power line”. Incredible changes and transitions have taken place in our globalizing world. The current change and transition has been continuing with a dazzling and increasing acceleration. Yesterday's mentality strongly opposing to the con-

nection of the island to Turkey even through pipeline, now buys electricity from TRNC as a result of the electric power shortage in South Cyprus following the power plant accident that took place not long ago, by turning 180 degrees. I believe that the ones who said yesterday that they would not engage in agriculture and ranch with Turkish water will be willing to use the water to be transferred through the pipeline from Turkey to the Island, when they see the quality and price of the water.

Yes, turning back to the project again; the first phase of the project is composed of the 23 kilometers long and 1,5 meters wide pipeline to be installed on territory from Alaköprü Dam with the capacity of 130,5 million cubic meters and 88 meters high, whose construction was started on Dragon Stream located in Anamur province of Mersin, and the Hydroelectric Power Plant (HES) with 32 megawatt installed power, and Pond to the Anamuryum equalizing tank on the coast. The 80 kilometers and 151 meters long sea passage of the project, the 3 kilometers long pipeline to be constructed in TRNC from sea through the Güzelyalı pump station on the coastline to the Geçitköy Dam, and the construction of 58 meters high Geçitköy Dam with the capacity of 26.5 million cubic meters composes the other two important phases of the project. What makes this project important in the eye of world; is the fact that such a long-distance transition with approximately 80 kilometers distance of sea transition is a first in the world, and the technology to be used during the aforesaid transition. Sea transition is passing a very special 1,6 meters wide polyethylene pipe hanging in 250 meters depth from sea level by tying the pipe with special ropes in each 500 meters to the sea bottom. Another point that should not be ignored here is the fact that throughout the pipeline between Turkey and Cyprus, the sea depth

reaches 1434 meters. Tenders on the project phase to be carried out both in sea transition and in TRNC pillar will have been concluded by late February and early March. So that, these two important phases of the project will have been launched by spring months. 1.5 years are needed for sea transition, and two years are required for the project to be carried out in TRNC. All in all, the project carries on as planned to reach 2014 March goal that is planned for the completion of project. With the completion of the project, Turkey will gain prestige in the region, and she will assume the leadership role in similar projects as a result of the experience to be obtained. The reflection of the successful completion of the project will be seen as the elimination of water problem in a 50-year perspective.

2.38 cubic meters of water will flow in TRNC, which will enter in summer months of 2014 without water problem, per second through 1,6 meters wide pipes to be installed; and this means 75 million cubic meters of water in total per year. While this continuous water resource to be provided for TRNC will not only be supplied as drinking-service water, but the first half will be used for this purpose in the first phase, whereas the other half can be used for agricultural purpose. And what it means is 4824 hectares on its own, or 48240 decares, or in short, 36053 acreages additional agricultural area.

Following a simple treatment process, water to be stored in Geçitköy Pond that will be reached the capacity of 26,5 million cubic meters, its 36-37 million cubic meters will be used for drinking purpose per year. The distribution network of water, which will be used as drinking-service water, was planned in a way to cover the whole TRNC. To sum up, especially in the light of first studies, it is thought that water to be used for agricultural purpose will primarily be transferred to Gü-

zelyurt District (not certain though) after the salinization status is examined, considering the fact that it will also provide the rehabilitation of aquifer. After the studies related to the subject take their final forms in the region, the cancellation of shafts salinated in the Güzelyurt District will allow direct use this water for agricultural purpose. If we still have water to use for agricultural purpose, the remaining water will be transferred over here beginning from the nearest districts to Geçitköy Dam that is the main resource, of course, by considering the results of soil test.

In conclusion, Turkish Republic of Northern Cyprus (TRNC) will have gained real freedom by crowning its political independence gained by Peace Operation on July 20th 1974, with its economic freedom to be gained thanks to this project that will be realized as of March 2014.

ORSAM: What will be the effect of TRNC Drinking Water Supply Project on Turkey's water policies?

Prof. Dr. Hüseyin GÖKÇEKUŞ: Scientific findings put forward that global climate change will increasingly make its effects felt on water resources in certain regions of the world at more severe and negative dimensions, especially in the forthcoming decades. Considering the fact that tomorrow will not be better than today, especially the countries in our region will inevitably turn towards seeking new water resources in order to be able to meet their water needs. Due to the increasing importance of water which is the essential of life and the cornerstone of sustainable development in a very short period of time, and also due to the fact that water does not have an alternative replacement; it will be further traded among the world countries. Similar to oil and natural gas pipelines currently surrounding the world, the construction of water distribution networks to

be built by the countries with water in order to provide water has become inevitable. In parallel with all these developments, soon afterwards, "water exchange" will naturally be created in Wall Street as oil, natural gas and gold prices. As everything that is important for world markets, "water" which is such an important meta that is this rare and valuable and as valuable as a life source is the candidate to be one of the most important combat elements among the global forces, maybe the most important one, in the forthcoming days. What is important is to achieve using current water resources in establishing friendship and peace instead of leading to chaos and war among the countries while struggling on its sharing, and to be able to achieve turning water into abundance and richness by equitably sharing it among the world populations in proportion to their needs. Otherwise, the heat of a war to break out anywhere on the world because of water would be enough to immediately set the world on fire. Once war breaks out, even if all the water covering three quarter of the planet is used, it will be insufficient to stop this war.

Following the successful completion of this project, a significant milestone will have been reached in "world's water transportation". In our region, which has been encountering a severe water shortage; especially in Mediterranean Region, Turkey's supplying water for East Mediterranean countries, in which Gulf countries and middle east countries are also located, within the next 10 years to a considerable extent goes beyond imagination. And this situation comes to mean that the importance of Turkey, who has been taking firm steps forward on becoming a super power in the region, on the region and on the world a lot more.

The 21st century will be the century of countries that have water and can correctly man-

age water. The issue of water, which is said to be on table during the talks maintained for the solution of Cyprus problem, may be an important opportunity for the solution of Cyprus problem that cannot be solved maybe for 40 years. Why natural gas and oil to be drilled that Turkish Cypriots have the same right as the Greek where exploratory drilling works still continue in the northern part of the island is not distributed to the Port of Iskenderun through North Cyprus and then to Europe!

Why the second pipeline is not installed in South Cyprus going through water shortage as least as TRNC, following the construction of the first pipeline that will solve the problem of TRNC in the first place! Why third and fourth pipelines are not transferred to the Gulf and Middle East countries in the following years.

We know that Turkey is not a country which is rich in water. However, there are considerable amount of water, billions of cubic meters of water flowing from Turkey's south into the sea. As a matter of fact, considering the fact that the capacity of Dragon Stream which will provide only 75 million cubic meters of water per year is 750 million cubic meters, if Turkey likes, the number of pipelines that can be installed only from this river can be ten times more.

I hope that the project of the century that dreams come true, the project of transferring water through pipelines from Turkey to Turkish Republic of Northern Cyprus contributes a lot to Cyprus and the peace in the region.

** This interview was carried out by ORSAM Water Research Program Specialist Dr. Tuğba Evrim Maden in Ankara, on March 1st 2012.*

ASSIST. PROF. DR. AYSUN UYAR:
 “ENVIRONMENTAL PROBLEM IS NOT ONLY THE PROBLEM OF NATURAL SCIENCE BUT ALSO THE PROBLEM OF SOCIAL SCIENCE”

5 May 2012

During the 6th World Water Forum held in Marseille, ORSAM Water Research Program specialist Dr. Tuğba Evrim Maden made an interview with Assist. Prof. Dr. Aysun Uyar, who works in Research Institute for Humanity and Nature (RIHN), about the studies of Institute on environment and water. In this interview, we talked to Dr. Aysun Uyar about RHIN, which provides source for the projects related to environmental problems and solutions with the specialists in research centers affiliated to interdisciplinary, foreign and domestic universities, and we also talked about the water studies.

ORSAM: First of all, could you please introduce yourself?

Aysun UYAR: I graduated from METU, Department of International Relations. After I did master degree in the same department in 2004, I started my doctoral research in Japan after I got a fellowship from the Japanese Government. In 2008, I completed my doctorate on Japan's free trade agreements and regionalization. Right now, I work as an assistant professor in RIHN, and also I give lectures such as “Introduction to International Relations”, “International Politics” and “Japan and Asia” both in Doshisha University and Ryukoku University. I still continue to carry out research on regionalization, East Asia regionalization mechanisms and environmental integration models. I met RHIN thanks to the World Water Forum organized in Istanbul in 2009. During my doctoral studies, I started to be interested in regional partnership



mechanisms conducted on environment, and in the post-doctoral period, I decided to carry on my research on the basis of interdisciplinary environmental studies and international environmental policies. I believe that RHIN, which has an interdisciplinary mission to understand environmental problems created based on the interaction between nature and humanity, is an ideal place to carry out my research. In addition to my own research, I also work in Research and Development Department of RHIN which carries on foreign contacts of the Institute and strategically directs its international relations.

ORSAM: Could you introduce your Institute?

Aysun UYAR: RIHN has an interdisciplinary mission, it hosts and provides source for inter-university common projects which aim at understanding environmental problems created based on the interaction between nature and humanity and finding solution for these problems in order for integrated environmental research to be settled as a department in Japan. We are affiliated to the Ministry of Education, and we totally work as academic. In cooperation with the specialists in research centers affiliated to domestic and foreign universities, we discuss the environmental problems through suggestions, and we provide these projects, which bring solution for these

problems, with source and opportunity. It will be the beginning of our 11th year in April. Considering that projects last for 5 years in general, it could be suggested that we are a young organization. The reason why we carry out our projects for 5 years is to be able to properly establish our academic and official contacts, and to constantly receive datum in the region. In addition to this, the formation process of the projects lasts approximately 2 years. Totally 7 years are required for a project and it is not possible for us to turn towards different or new subjects each year because of this long process. However, we have a quite large spectrum of subject and area in terms of content, thanks to the research programs created during the establishment of the Institute.

In accordance with the establishment provisions envisaged by the Ministry of Education and the Research Institute of Human Sciences we are affiliated to, we carry out our research completely based on scientific datum and academic studies. Therefore, we do not provide source for profit-oriented assistance and support projects which are for the introduction of new technologies or which are directly related to non-governmental organizations. Another characteristics of ours is that our projects perceive environmental problems as much as possible, and they are interdisciplinary studies that produce solutions accordingly. Our starting point is (first in Japan) to understand and address the environmental problems not only in terms of natural sciences, but with an approach that can integrate natural sciences, social sciences and human sciences. For example, I work on international relations and regionalization. But there are also economists, archeologists, historians, hydrologists, geneticists, soil specialists and many other natural scientists, social scientists and human scientists working in cooperation within the Institute. A project is carried out with the participation of 80-100

people with the central group and in Japan and the partners in the region, and there are advisors and also fellows who work part-time within this group.

ORSAM: Do you have works in the field of water?

Aysun UYAR: When it comes to environment, water is automatically one of the major subjects for us. Each year approximately 12 projects, which are at various stages of the 5-year application plan, are carried out within our Institute, and these projects are classified in accordance with the 5 major research programs envisaged in an attempt to encourage interdisciplinary communication among researchers. Those which are for the basic environmental research among these programs are called circulation, sources and diversity. Water is the subject in the projects included in all these programs both because it is a natural resource and also because of its major role in natural circulation and diversity. In addition to these, we have two other programs. You can see water in those programs as well. One of them is called “ecosophy”, and it is composed of projects studying the perceptions of people and societies on environmental consciousness and change, as well as how they keep up with the environmental changes. In other words, subjects such as; what is our perception about environment, how environmental problems and nature has been approached in our culture, language and religion; and thus the subjects on how water is perceived within the society and how it is used, are discussed within our Institute. Our fifth program is “ecohistory”, as is evident from its name, it is composed of projects which analyze the environmental issues in historical terms and which studies how environmental change has affected the march of historical events (or the contrary). Within the 10-year process, we have completed 30 long-

term projects, and we still actively carry on some of them. More than half of these projects are related to water. Thus, water constitutes one of the most basic data and research fields for us.

ORSAM: Have you had projects about Turkey?

Aysun UYAR: Our projects have generally been in Southeastern Asia, Central Asia and in Western Asia. In addition to these, we have carried out two projects in Africa. In our projects, rather than directly working on the main theme of water, we touch on subjects related to water and we tackle a water-related environmental problem. In this case, you can consider water as a basin, sub-theme or as a factor coming up afterwards within the research. Let me talk about the first and the only project that we have carried out in Turkey. It was one of the first projects of our Institute which started in 2001 and completed in 2006. In this project, which was conducted on the agricultural production change and diversity of climate change in arid areas, the researchers worked on what kind of agricultural change would take place in the following 50-70 years in Seyhan Basin with the effect of climate change, and on possible models. In this project, water-related datum were extensively used, as the irrigation methods directly affecting agricultural production and produc-

tivity were selected as the baseline. While the project was conducted, local authorities, universities, TUBITAK and DSI worked in cooperation.

ORSAM: What are your current projects?

Aysun UYAR: In the first 6-year period of the Institute, studies based on cognitive science studying and analyzing environmental problems were prioritized. As of academic year of 2010, the second 6-year period of the Institute started; and in this period, projects and studies based on design science for sustainable society and environmental formation have rather been prioritized. Each year, 2 or 3 new projects are launched. Our projects that were launched this year consist studies based on raising the environmental consciousness for desertification, sustainability in the coastal areas of Southeastern Asia and the creation of new joint environmental areas.

ORSAM: Thank you for your time.

Aysun UYAR: You are welcome.

** This interview was made by ORSAM Water Research Program Specialist Dr. Tuğba Evrim Maden, between 12-17 March 2012, during the 6th World Water Forum carried out in Marseille, France.*

TESFAY ALEMSEGED: “EGYPT, SUDAN AND ETHIOPIA HAVE GOOD RELATIONS ABOUT RENAISSANCE DAM’S TECHNICAL AND SECURITY ISSUES”

25 August 2012

We talked to Tesfay Alemseged, who works for the Ethiopian Institute for Water Resources, about the policies on energy and water pursued in Ethiopia, about the Grand Renaissance Dam and about the relations with riparian countries such as Egypt, Sudan and Kenya within the scope of this project.

ORSAM: Can you introduce yourself?

Tesfay ALEMSEGED: My name is Tesfay Alemseged and I am working for the Ethiopian Institute for Water Resources which is operating since a year and half. I am working on the centre of excellence for the water sector in Ethiopia. In my opinion, these problems in different parts of fragmentations of the academia are associated with the water sector and water agriculture environment which are working in a highly fragmented situation, so the integration of the academic institutes with community is quiet weak. This is part of my job as an outreach and community engagement program coordinator for the institute. Because of this fragmentation of integrated interventions, especially agricultural sector suffers from series of droughts. Food insecurity is a big issue and the government is working as a key strategy as to build implementation capacity of all stakeholders including the research agencies, operation agencies so that they address real community problems on the ground. Considering the current transformation plan in Ethiopia there are some good indications in the economy and education. Water sector is one of the important sectors which are still in a preliminary



stage. The government is committed to work on this issue at high level and also focus on a security aspects and generation of hydro-power, which is based on water sector, but the issue of fragmentation still is a concern. This kind of training in water diplomacy facilitates the implementation activities at national level as well as the integration with our neighbours and Nile. Despite absence of support from various international agencies for very long time, the government initiated works after serious economic improvements in the country, especially for the last eight years. We believe that we can do by our own, and every citizen has shown commitment to contribute for instance civil servants granted their of monthly salary at minimum and this is considered as a working in our capacity so that we can realize the economic growth and we call it Grand Renaissance Dam. Dam is going to be realized based on local capacity and this creates even a unity in the country, unity of thoughts. As you know Ethiopia diversified in different nationalities. Economic growth especially focus on a key point on water is a common understanding for every part of different groups. So we believe that strength comes from inside, we can also bring our partners riparians including Sudan, Egypt and Kenya. We have partner riparians and we are currently working together and we have started to talk and to listen to each other and because of this the Nile Basin Initiative is working well on top of

bilateral relationships with Egypt, Sudan pertaining safety and technical details of the ongoing construction of Renaissance Dam.

What can you say about the 2010 framework Agreement on the Nile?

Tesfay ALEMSEGED: Currently the agreement is signed by major number of states and only countries which are expected to join for sign the agreement are Egypt and Sudan. This is somehow a big move in creating a common vision and creating common understanding for exploring the potentials of partnership among the riparian states. Also, Nile is a big river in the world which has created its own interactions within the societies and communities as a family that are dependent on common resource. We believe that we have to work together and create prosperity together, instead of staying fragmented and separate national interests.

ORSAM: Is there any water consuming plan on Grand Renaissance Dam.

Tesfay ALEMSEGED: Grand Renaissance Dam is quite a huge plan and the priority is hydropower generation but there is no point that Ethiopia cannot use it for agriculture. However the topography of the area can limit us since, Nile flows through narrow gorges. However we have eleven rivers and Nile is just one of them which covers medium part of Ethiopia but there are other rivers which have a big potential for irrigation. Ethiopia is embarked on a big irrigation programme.

We consider that we can transform our agriculture through transforming it into an irrigated agricultural system from its previous position as a rain fed because rain fed is not working at this point because population size has increased a lot and environment changed drastically. Focusing on highland farming and

the mountains area and it demands an immediate solution of helping the farmers to adapt technologies related to agriculture and irrigation. So beyond that we are embarked on eleven huge sugar cane plantations for sugar factories through the country which are based on irrigation. Also household irrigation programs are going well with a series of programs and projects that are extending through the country. The issue now comes to creation of an extended full irrigation program like value addition and such things have to solve some of the systemic problems that are observed at farmer level, that produce seasonal crops and their reliability of crop at marketing and value addition are additional points are going to be looked into with our engagement.

ORSAM: Last question is do you see any cooperation fields between Turkey and Ethiopia on the irrigation, on the water issues?

Tesfay ALEMSEGED: We were discussing in our institutes with collages about the technology transfer, exchanging knowledge and expertise. One of the focuses for Ethiopia is Turkey, because we have many similarities despite the level we are living now. We believe that there are some areas which are done better in Turkey such as rain water harvesting and collecting of seasonal floods to make a better farming and horticulture activities.

Moreover, Turkey has various investments in Ethiopia, basically on textile industry, construction. Water sector is an important sector which needs to be taken into consideration and I believe in exchange of expertise and exploring potential partnerships between our countries can be effective and historical relations between two countries. Additionally, actual relationship in the textile, in the construction activities is quite satisfying for Ethiopia. I am familiar with one of Turkish

companies working construction of cement factory which is one of biggest industries in Ethiopia, this has created even additional relationships and beyond that even Turkey has so good relationship with Ethiopia in maintaining historical and religious places. Also

many schools in Ethiopia are called Turkish and Necashi schools. So these are historical basis of relationship between the people and government in Turkey and in Ethiopia.

ORSAM: Thank you very much

HÜSEYİN GÜNDOĞDU “ONCE AGAIN, TURKEY WILL CARRY OUT AN ACTIVITY IN COOPERATION WITH ICID TO BE HELD FOR THE FIRST TIME IN THE WORLD”

16 November 2012

ORSAM Water Research Programme made an interview with ICID Vice President Hüseyin Gündoğdu on ICID, its importance, and irrigation and modern irrigation techniques in Turkey during the 10th European Conference on the implementation of the EURO INBO 2012 Water Framework Directive held in İstanbul on 17-19 October 2012. “Once again, Turkey will carry out an activity in cooperation with ICID to be held for the first time in the world. The First World Irrigation Forum on Agricultural Irrigation to be held for the first time in the world is going to take place in Mardin. I invite you all to the forum to be held next year. Because irrigation is so important, and as you know, today 70 per cent of our water resources are used in agricultural irrigation,” says Dr. Hüseyin Gündoğdu.

ORSAM: First of all, could you introduce yourself please?

Hüseyin GÜNDOĞDU: I work as a Senior Agricultural Engineer in Planning Branch Directorate in the Second Regional Directorate of State Hydraulic Works. During twenty five (25) years of experience on Irrigation and Drainage subjects, I have worked in various institutions and organizations. DSI - General Directorate of State Hydraulic Works - comes first among those. In addition, I also worked in GDRS (General Directorate of Rural Services), Provincial Directorates, private sector and as a private consultant. At the end of 25 years, I was elected as the Vice President of ICID (International Commission on Irrigation and Drainage).



ORSAM: Could you tell us about ICID? When was it established?

Hüseyin GÜNDOĞDU: ICID is a non-governmental organization established in 1950, but it generally works in cooperation with water-related state institutions in the countries it works with. 110 countries are members of this organization. Each country has a commission and committee related to this organization, and in our country it is the General Directorate of State Hydraulic Works (DSİ). In other countries, the similar organizations like DSI are the members of ICID. The headquarter of the organization is located in India. It is a technical NGO which carries out technical scientific studies mostly on irrigation and drainage, works on techniques for efficient and productive irrigation, carries out research to improve water and increase the efficiency of use of water, and which spreads all these developments across the world. As I mentioned before, organizations that are members of this organization are generally public institutions of those countries. Nevertheless, ICID has been trying to spread to

more people, institutions and organizations, and therefore in a conference held in Australia this year, it took new decisions to enable private sector and individuals to be a member as well.

Turkey became a member state of ICID in 1954. From time to time ICID and Turkey had some breaks in their relations. As is known, DSİ was also established in 1954. Despite the decline in relations between DSİ and ICID, Turkey started to attach importance to this organization again as DSİ approximately for the last 8-10 years, and to send specialists to working groups and technical trainings within the organization. Turkey aims at transforming its 60-year irrigation experience to the international organizations. Turkey is now a country which wants to be in a decision maker position in irrigation or water policies. Therefore, it was not enough for Turkey to support these working groups, and it was also focused on the necessity to take part in the administration. So that, it took part in the elections. Each year 3 people are elected in the aforesaid elections, but this year 6 candidates ran for vice presidency. During this process, Turkey received an offer from ICID. Because Turkey is an experienced from the forums, and especially the World Water Forum that Turkey held in 2009 is a quite important experience. ICID, on the other hand, wants to go beyond technical and take part in an activity embracing the whole world and different groups. To that end, ICID decided to organize an irrigation forum to be held triennially bringing not only the scientists but also farmers and decision makers in private sector related to irrigation together. As I stated before, ICID offered Turkey to pioneer this forum due its broad experiences, and Turkey accepted the offer. The first world irrigation forum is planned to be carried out in Mardin in the forthcoming year between the dates 29 September and 5 October 2013.

ORSAM: Why was the irrigation forum decided to be held in Mardin? Is GAP one of the underlying reasons?

Hüseyin GÜNDOĞDU: Every year, a technical meeting entitled Asian Regional Conference is organized in ICID. The structure of these conferences was changed into a forum. In ICID everything is systematical and proceeds regularly. Which activities to be carried out within the programs is certain three years in advance. Turkey applied for holding the 8th Asian Regional Conference three years ago, and it also stated that it would be held in Mardin. It is accepted, but as I said, the conference turns into a forum and Mardin keeps being the place of the forum. Why Mardin? Of course, GAP is one of the primary reasons, we want to show the regional development caused by GAP to the whole world. Besides, Mardin is a city that has been attracting lots of attention where many cultures live together.

ORSAM: Is there any organic bond between ICID and the World Water Forum?

Hüseyin GÜNDOĞDU: ICID applied for taking part in the governing board, and it will become clear in the elections to be held in the forthcoming month. However, ICID carries out many activities in World Water Forums; It works in cooperation with FAO, Asian Development Bank etc. on lots of thematic subjects, and they also organize subsidiary activities.

ORSAM: What is the current state of irrigation and drainage in Turkey? Is DSİ the competent body?

Hüseyin GÜNDOĞDU: In the past, GDRS (General Directorate of Rural Services) and this institution were responsible for irrigation. Drainage is known as the removal of sur-

plus water from an area. Currently, the most competent body on irrigation and drainage is DSİ. Along with the agricultural reform and cooperating with some organizations affiliated to the Ministry of Agriculture, DSİ is the most competent body in technical terms.

ORSAM: When we compare the irrigation and drainage in Turkey with the other countries, what can we say in positive or negative terms in this respect?

Hüseyin GÜNDOĞDU: Irrigation by all means depends on the technological progress. Much more productive use of water is aimed through the current modern technologies. Turkey has been improving irrigation for the last 60 years, and today there is some 5 billion hectares of irrigation field. 3-3,5 million hectares of field waits for the irrigation investments. Our current irrigation systems were built according to the technology of those years. Right now we are striving to pass to a closed system, and when we do so there will be 30 per cent more water-saving. So, we need to turn towards water-saving technologies. Considering the current irrigation of Turkey as a whole, the closed system is some 10-12 per cent. We have lots of things to do, we need to use high-technology.

ORSAM: In our country, drip irrigation is encouraged, and certain banks in Turkey encourage drip irrigation as well. Is drip irrigation on the rise?

Hüseyin GÜNDOĞDU: Yes, it is considerably on the rise. As I mentioned, this rate reached 10 per cent for about 8-9 years, it was at the level of some 3 per cent beforehand. Turkey had some difficulty in producing drippers ten years ago. Now Turkey can produce dripper by using the technology. Our private sector made a break-through on this subject. The awareness among farmers increased as

well. The importance of water on issues such as climate change, drought etc. started to increase. This awareness is quite important. There is a water-saving up to 30 per cent in the areas where drip irrigation is implemented. All these developments can be achieved through the use of high-technology. But of course it is not sufficient, because using the high-technology wisely plays an important role in the efficient and effective use of water. You produce drip irrigation systems, but you cannot use it wisely; then you cannot succeed either. DSİ and the Ministry of Agriculture have trainings on this subject.

ORSAM: Approximately how much water is used per hectare?

Hüseyin GÜNDOĞDU: The need for water depends on the plant species. Roughly speaking, 7-8 thousand cubic meters of water is used per hectare in an open-channel irrigation. But in drip irrigation system, this figure might drop below 5 thousand cubic meters of water. This figure indicates a major saving. If you use it wisely also in open irrigation, you can further drop this rate. It might be 4000-5000 cubic meters on average per hectare tops. But of course it applies to cotton plants, it might be different for corns. These figures depend on plant species, soil structure, and the weather condition. The figures I mentioned are average values.

ORSAM: Is there anything you would like to add?

Hüseyin GÜNDOĞDU: As you know, Turkey wants to share its experiences on water management both with its region and the whole world, as well as to share its knowledge and experiences to them. Our country proved it by organizing a successful World Water Forum. Turkey will carry out another activity in cooperation with ICID to be held for the first

time in the world. The First World Irrigation Forum on Agricultural Irrigation to be held for the first time in the world is going to take place in Mardin. I invite you all to the forum to be held next year. Because irrigation is so important; as you know, today 70 per cent of our water resources are used in agricultural irrigation. It is equal to a substantial amount of the current water resources. The developments on the subject are announced on the websites:

<http://www.worldirrigationforum.org/>
and <http://www.icid.org/>

ORSAM: Thank you for you time.

** This interview was made by ORSAM Water Research Programme Specialist Dr. Tuğba Evrim Maden on 18 October 2012 during the 10th European Conference on the implementation of the EURO INBO 2012 Water Framework Directive held in İstanbul.*

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