



International Conference on  
Water Resources & Environmental Management



## Report

### **Third International Conference on Water Resources and Environmental Management: “Role of Governance in the Management of Water Resources and Environment” (ICWRE - 2014)**

**Antalya, Turkey  
13<sup>th</sup> - 15<sup>th</sup> May 2014**



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## I. Introduction

In response to increasing water scarcity, environmental degradation and the United Nations 2014 year of Water and Energy, the Global Institute for Water, Environment and Health (GIWEH) has organized its Third International Conference for Water Resources and Environmental Management (ICWRE) in Antalya, Turkey. This conference follows two previously successful ICWRE conferences; ICWRE-2013 organized in Geneva, Switzerland, 09-11 April 2013, and ICWRE-2011 organized in Marrakesh, Morocco from 20-24 November 2011.

The role of good water governance is essential for water security, and subsequently, security for energy and food. Water governance is defined by the Global Water Partnership as *'the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society'*.<sup>1</sup> Water resources and services can be managed according the framework of integrating stakeholder interactions to maximize the economic and social wellbeing in an equitable manner without compromising the sustainability of ecosystems. However, there is a gap between policy, sciences and practice that needs to be removed in order to secure this new framework. IWRM and this gap are being debated and discussed around the world by decision makers, water and environmental professionals and NGOs.

## II. Organization of Work

To further contribute to debates at national, regional and international levels, the Global Institute for Water, Environment and Health (GIWEH) has taken the initiative to organize its Third International Conference for Water Resources and Environmental Management titled "Role of Governance in the Management of Water Resources and Environment" (ICWRE-2014). The conference was held in Antalya, Turkey at the Harrington Park Resort and Conference Center from 13<sup>th</sup> – 15<sup>th</sup> May 2014. This conference was organized in collaboration with Akdeniz University.

The three-day conference was structured to include oral sessions and a poster session that allowed for in-depth discussions on the aspects of water resources and environmental management with a focus on key issues related to the adoption of integrated approaches, the hydro-diplomacy of shared water sources, regional challenges of water cooperation, and technology transfer and its institutionalization. The different sessions provided a platform to debate challenging and emerging issues, share experiences on best practices, and network through presentations, panel discussions and one-on-one dialogues. The main themes of the conference were addressed in in five main sessions:

- i. Integrated Water Resources Management and Water Governance
- ii. Integrated Water Resources Management and National Water Sector Management

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1 Rogers, P. & Hall, A., "Effective Water Governance", Global Water Partnership Technical Committee, Background Paper. 7 (2003) pg 7.



- iii. Enabling Environment for Water Resources Management
- iv. Regional Challenges and Opportunities for Water Resources Management
- v. Science & Technology: Ground Water Management, Water Management, Water Pollution

The conference target group was composed of academia, government agencies, NGOs, private sector, and water and environment networks. ***The table of conference participants is shown in Appendix II.***

### **III. Opening of the Conference**

The conference was inaugurated by **Didier Barthe**, President of GIWEH. In his opening speech he stressed the importance of water and the causes of severe water problems around the world. 'Today, the world suffers from severe water problems caused by global changes including population growth, migration, rapid urbanization and climate change.' He expressed that present and future leaders have to look for innovation, solutions and improve governance to protect our important natural resources. 'Solutions are available at different scales but it need to be managed and disseminate in the right way.'

Following Mr. Barthe's message, **Prof. Mohamed Abdulrazzak**, Head of ICWRE 2014 Scientific Committee, expressed his appreciation to GIWEH and Akdeniz University for organizing this conference. A special thanks was given to the Scientific Committee for their hard work on the approving the journals and wished the participants a successful conference.

The third speaker was **Gürhan YALÇIN**, Vice-Dean of the Faculty of Engineering at Akdeniz University. He spoke on behalf of the Dean of Faculty of Engineering, Prof. Dr. Feramuz Özdemir. He articulated that this conference is a great platform to share experiences from different countries facing water scarcity and water quality issues. 'As we all know, water resources are getting scarce and we all have to work for sustainable management of water.' He hopes that the outcomes will be beneficial to everyone.

***The summaries of the speeches are offered in Appendix III.***

The final speaker was **Dr. Nidal Salim**, Chairman of the conference and Director of GIWEH. First, Dr. Nidal explained water is at the center of many political, social, economic and environmental issues. 'If we do not care, if we do not give more attention and good governance for the water resources, water will be a source of dispute and conflict.' Now the trend in the international community is water security. He gave a brief history of the development of the water agenda and expressed his opinion that 'water will be very much highlighted' in the next 10 years.

He mentioned the main objectives for this conference including building networks and bridging the gap between science and policy making. Dr. Nidal stressed the need to build a type of relationship between ministries, universities, non-governmental agencies and private industries to aid in the achievement of needs of those involved in the role of governance for the management of water resources



and environment. He mentioned that his organization is completing a type of Memorandum of Understanding with the State of Iraq, Ministry of Water Services in Libya and Palestine.

'We are helping them and they are helping us to develop the water sector in their country. We are putting them at top positions in the development process and to have connections to the United Nations, Swiss organizations and universities in order to develop their research and the scientific careers.'

Finalizing his speech as the last speaker of the opening session, Dr. Nidal announced the official opening of the conference. 'We are here to cooperate with you and we would like to develop ideas and cooperation and further our collaboration in the future.' ***The complete speech is shown in Appendix IV.***

## **IV. Presentations and Dialogue**

The five technical sessions of the conference addressed many priority and emerging issues in the water and environment fields with keynote speeches, presentations and discussions chaired by distinctive experts. Following the summaries of the sessions include the sixth section with other events such as workshops, and the last section, *vii*, lists the posters that were displayed during the conference. ***The conference agenda is show in Appendix I.*** Sessions:

### **i. Integrated Water Resources Management (IWRM) & Water Governance**

**Keynote** - Madame Shuroq Al-Abayachi, Director Water Resources, Iraq Ministry of Water spoke on '**Water Governance in Iraq**'. After reminding us the main water resources in the region and the importance of irrigation, she questioned the policy to implement control structures and dams since the current storage capacities of rivers exceed their annual discharge. For her, the future of the region will depend on the ability to improve water use efficiency, especially in irrigation.

**'Making Water Governance Real (Metropolitan Water Governance, Specific to Istanbul Metropolitan)'** was presented by Ms. Huriye Incecik Ceylan, Expert, Ministry of Forestry and Water Affairs, Directorate General for Water Management, Turkey. She explained the appropriateness of good governance where national incentives are supported by government instruments to achieve integrated water policies. To improve local service delivery, the trend should be more decentralized management.

Mr. Candra Samekto, School of Agriculture and Food Science, University of Queensland, Australia presented on '**Snowballing State-Private-Society Collaboration in Addressing IWRM Initiation Challenges**'. His research focuses on the role of collaboration in water management. The case study of the Citarum river basin show us the necessity of the multi-approach to achieve the goal. The government gives the guidelines with the support of the multi-background community.



**‘Water Sector Management via AWRM Approach in Countries of the Arabian Peninsula’** was delivered by Prof Mohamed Abdulrazzak, Department of Civil Engineering, Taibah University, Medina, Saudi Arabia. He spoke of water resources available in Arabian Peninsula and underlined the lack of cooperation among countries. Policies vary depending on the strategy of the country but focused on desalination and groundwater mining. He concludes IWRM approaches will have to be the priority.

Eng. Ahmed Al Barwani, Water Resources Expert, Ministry of Regional Municipalities and Water Resources, Sultanate of Oman spoke on **‘Water Resources Management Practices in the Sultanate Oman’**. Many challenges were discussed, especially the water deficit linked to the scarce availability of the renewable water source. Regarding the practices, he emphasized the regulations, implementation, and monitoring which have led to the preparation of the national water resources master plan.

## **ii. IWRM & National Water Sector Management**

**Keynote** – Prof. Abdulgader A. Abufayed from College of Engineering, University of Tripoli spoke about the **‘Non-Technical Approaches to Water Security Management in the MENA Region’**. In the last 60 years, this region has been experiencing water scarcity and 60% of the region’s water is imported. He spoke of non-traditional approaches such as agricultural demand management, changing stakeholders’ behaviors and improving food consumption practices.

**‘Challenges to the water sector in Jordan: a critical look’** was presented by Dr. Abbas Al Omari from Water, Energy and Environment Centre, University of Jordan. Many challenges were discussed including political challenges such as the influx of refugees therefore placing pressure on water resources, social challenges such as the lack of awareness, and energy production challenges causing high water intake.

Ms. Eva Docampo from Amphos 21 Consulting S.L., Spain, presented on **‘A Multidisciplinary Partnership to support Water Resources Management in Cabo Delgado: stakeholder’s participation as a key factor.’** There is a lack of infrastructure and proper management of water in Cabo Delgado, Mozambique. ARA-Norte, the administration involved, lacks information, proper monitoring network, and awareness among stakeholders. Her project is to strengthen ARA-Norte capacities and relevant stakeholders. Results showed the awareness is increasing and there is cooperation among stakeholders.

Dr. Zeinab Shaaban Abu-Elnaga from Faculty of Science, Mansoura University and Director of MUIRO, Egypt presented on **‘Water Demand and Water Pollution in Egypt’**. She mentioned there are no clear strategies for Egypt’s agriculture pollution. Water pollution, such as algal blooms are a form of water loss. Through her research she conducted water and soil analysis, and phytoremediation studies using 2 strains of microalgae for water pollution treatment and reuse. Her



conclusions found when using *Scendesmus sp.* algal strain a reduction of half of the pesticide residue concentrations.

Prof. Dr. Ayse Muhammetoglu` from Environmental Engineering Department, Akdeniz University, Turkey presentation was titled **‘Towards the Implementation of the European Union WFD in Turkey’**. In 2012, Ministry of Forestry and Water Affairs implemented two regulations: ‘Management of Surface Water Quality’ and ‘Protection of Water Basins and Preparation of Management Plans’ these initiated national projects such as in the Buyuk Menderes River Basin.

Prof. Dr. Ismail Koyuncu, head of National Membrane Technologies Research Center, presented **‘Membrane Technologies in water treatment and desalination’**. He spoke of the various alternative water sources such as desalination, wastewater membrane technology, and water transferring. He went in-depth of the technologies behind membrane technology and the different filtration processes.

**‘Contribution of GIS in selecting the favorable site for the location of the station purifying wastewater of Azrou City’** was presented by Professor Abdellah El Hmadi from Moulay Ismail University, Morocco. His research uses geomatics software tools to look for a site to purify wastewater in the city of Azrou. This would mitigate the negative impacts where the waste water is directly discharged into the environment. His results showed 5 sites with 1 being highly favorable for the WWTP.

Dr. Khaled A. Rashed, Associate Professor, Department of Civil Engineering, Faculty of Engineering, University of Tripoli, Libya, spoke about **‘A Proactive Plan to Improve Urban Water Sector in Libya.’** He first explained Libya’s high consumption of water that needs to decrease to protect water sources. He proposes a proactive plan by researching two cases: uncontrolled and controlled water demands. One finding was that uncontrolled demand will result in increased wastage of financial and water resources. However, with a consumption management program, Libya’s supply is expected to decrease.

**‘Domestic Water Security for Sustainable Development in North Central belt of Nigeria’** presented by Mr. Samuel Ibbi Ibrahim, Department of Geography, Faculty of Natural Sciences, Ibrahim Badamasi Babangida University, Lapai, Nigeria. He examined the caustic importance of water security in relation to people’s desire for survival. Many public water management operations are performing inefficiently and mentions the inequalities among rural and urban centers. He urges the government to develop a clear strategy for better water efficiency through partnership.

Ms. Hlamulo Makelane, Human Sciences Research Council, South Africa presented on **‘The Impact of Environmental Management Plan on Firms’ compliance with Government Regulations and Environmental Laws’**. She spoke of the huge gaps in compliance of environmental laws and their monitoring. Her research studied public and private manufacturing firms to inspect, observe, and test water samples in order to analyze their environmental mitigation. Results showed no



compliance. After only 6 months of EMP application results showed an increase of 40% non-compliance; 1 year 100%.

**'The Management of Urban Water Bodies in Ghana: the case of the Kumasi Metropolis'** was presented by Dr. David Forkuor, Kwame Nkrumah University of Science and Technology, Department of Geography and Rural Development, Ghana. His study examines the environmental awareness of land users along the waterways and its impacts. Through qualitative instruments, some of the results showed that the waterways have become highly polluted and land users' awareness is extremely low. Recommendations include enforcing the Water Act and train volunteers to watch the rivers.

### **iii. Enabling Environment for Water Resources Management**

**Keynote** - Mr. Samuele Ambrosetti, Senior Engineer, D'Appolonia SPA Italy, **'Development of a modular reconfigurable water bag for long distance freshwater transport over the sea: from concept to full scale demonstration.'** He spoke of water scarcity and gave one solution: water transport by using waterbags. There are drawbacks; difficult handling and sanitation. The REFRESH project allows for the innovation; single modular bag, watertight zipper, and monitoring system. Now they are trying to reach commercial size of 5000m<sup>3</sup> and demonstrate a full-scale sea voyage.

Dr. Salaheddin Shmela, Civil Engineering Department, Tripoli University, Libya presented on **'Water Desalination and Water Transport'**. He spoke of the 'Man Made River Project' (MMRP) in Libya where a pipe line was built to transport water. His project compared the infrastructure and running costs between transferring water and desalination. It was found that desalination provides more benefits such as technology advancements and lower costs than from non-renewable water transfers.

**'A large scale seawater desalination is a sustainable option for Gaza water supply'** was presented by Eng. Mahmoud Ismail Director of National Water Council Unit (Gaza/Palestine) and Coordinator of Desalination Project, Palestinian Water Authority. He asks the question of 'needs vs wants'. In March 2014, GSWSP spent 40Million USD on a gas fired plant central desalination plant (RO).

Prof. Kamal Mohammedi, MESO team, ELEM/UMB presented **'Carbon Footprint Assessment of Desalination Industry in Algeria'**. He spoke of Algeria's desalination capacity of 2.2 millions m<sup>3</sup>/day collectively releasing 1500 tons CO<sub>2</sub>/day. He concludes shifting to low carbon desalination is possible through implementing energy efficient plants, integrating renewables, and creating coastal wetlands.

**'Role of HANDS to provide sustainable access to WASH services: A study of Government and Non-Government Schools in Gadap Town'** was presented





by Ms. Rubina Jaffri, General Manager of HANDS, Pakistan. The project aims to provide students with access to water and sanitation services in 509 schools in the urban slum Gadap town, Karachi. She summarized their baseline study explaining open defecation is a serious matter and more prevalent in Government schools than non-government. HANDS interventions include establishing a water-testing lab, rebuilding school toilets, and raising awareness.

#### **iv. Regional Challenges & Opportunities for Water Resources Management**

**Keynote - 'Urban water sustainable management under climate change conditions: acknowledging its true value, defining its full cost, setting a socially fair price'** was presented by Dr. Vasilis Kanakoudis, Assistant Professor, Civil Engineering Department, University of Thessaly, Greece. He explained the challenges of accepting a pricing policy: the improper acknowledgement of water valuation and understanding the cost of water defined as direct, environmental and resource. He concluded climate change impacts all costs of water and one should use the water balance exercise and pay its fair share.

Mr. Rajibur Reza, Department of Accounting, Finance and Economics, Griffith University, Australia presented **'Fundamental Signals of Investment Profitability in the Global Water Industry'**. He explained private sector participation in investing in 'blue gold'. This study, investigates 11 companies and their relationship with certain variables. They found five variables that can signal profitability of investment in the water industry such as labor force, accounts payable and accounts receivable.

Ms. Zain M. Al Hourri, Civil Engineering Department, Applied Science Private University, Amman, Jordan, spoke on **'Sustainable Urban Drainage Recommendation for Future Direction in Rain Water Management in Jordan'**. She spoke of Amman City's problem of high-urbanized areas where there is increasing risk of intense rainfall causing flooding. From estimating runoff and researching SUDS, the recommendations include permeable pavement, green roofs, retention ponds, and rainwater capture.

**'Water Sector in Israel and its Impact on the Palestinian Water'** was presented by Eng. Mahmoud Ismail, The Palestinian Water Authority, Palestine. He spoke of the trans-boundary issue between Palestine and Israel where Israel controls more than 85% of the Palestinian West Bank water resource. Israel prevents the surface water to flow naturally to the Gaza Strip, explaining the inequality of water consumption between an Israeli and Palestinian. There are additional constraints and obstacles imposed by Israel. This study aims to highlight the Palestinian water rights and Israel's water strategy.

**'Water Governance in Georgia'** was explained by Ms. Nino Abuladze, United Water Supply Company of Georgia, LLC and Ministry of Regional Development and



Infrastructure of Georgia. She spoke of the key stakeholders including United Way Supply Company of Georgia where they provide water and sewage services to the population. With donations from ADB, EIB, WB, EU, EBRD and USAID various projects have been implemented such as construction and rehabilitation works and pumping stations.

## **v. Science and Technology**

This session is divided into three sessions covering groundwater management, water management and water pollution.

### **a. Groundwater Management**

**Keynote - Mohamed Abdulrazzak**, Professor of Water Resources Management, Civil Engineering Department. Taibah University, Medina Saudi Arabia, and Former: Senior UNESCO Regional Director, Cairo, Egypt and Deputy Executive Secretary, UN-ESCWA, Lebanon.

**'Study of water potential in the Saïss basin and development of a model of integrated management of water resources by the WEAP tools'** was presented by Prof. Ali Essahlaoui, Research group "Water Science and Environmental Engineering", Geo-engineering & Environmental Geology Department, Morocco. This study discusses the features of good governance for IWRM, highlighting the Moroccan government. Then he utilizes WEAP as a tool to show the fragility and vulnerability of the Saïss aquifer.

Dr. Khalid Qahman, Gaza Islamic University and Environment Quality Authority, Palestine presented **'A Simulation/Optimization Approach to Manage Groundwater Resources in the Gaza Aquifer (Palestinian) Under Climate Change Conditions'**. He spoke of the Simulation/Optimization method and how it is able to identify a possible optimal solution for the management of the Gaza coastal aquifer. This aquifer represents a case where extracted salt water is significantly lower and groundwater levels have also increased. The procedure aims at maximizing pumping rates, while limiting salt concentrations.

**'Estimating the Effect of Qanats and Underground Dam on Water Levels in Wells, Using Finite Difference Simulation'** was presented by Mr. Babak Vaheddoost, PhD candidate, Department of Civil Engineering, Istanbul Technical University. For this analysis he considered the case of the Sufi Basin. He used a finite difference method with backward in space and forward in time manipulation. Looking at the results of his research he confirmed that, on this case, the method provides a good estimation.

Dr. Baghdadi Boukerma, Hydrology & Water Resources Management Laboratory, Department of Hydraulics, University of Science and Technology, Algeria explained **'Modeling of groundwater flow of the aquifer system in the plain of Mléta - Sebkhia Basin of Oran (Algeria)'**. The main objectives were to implement a tool for managing groundwater and explain a mathematical groundwater flow model.



Thanks to the model he managed to quantify the groundwater reserves existing in the study area and made recommendations for the improvement of artificially groundwater recharge.

**'High Abstraction Impact on the Groundwater Resources on the South Area of Libya'** was presented by Dr. Almabruk A. Sanoussi, Civil Engineering Department, Tripoli University, Libya. In his research he examined the existing problems of water shortages, high population growth, and extensive groundwater withdraw, especially in Morzuk basin, and unwise water resources management. He mentioned man-made rivers, wells fields, and the decline of soil. He underlined, as in Libya, the expected impact of global climate change will be acute in all aspects of life, both direct and indirect.

Dr. Abdelhadi El Ouali, Research Team "Hydrogeology & Environment", Faculty of Science, University Moulay Ismail, Meknes spoke on **'Revelation of the lateral Mixture between Two Reservoirs at the Level of the Basalt Aquifer of Tigrigra (Morocco) by the Hydrogeological and Isotopic Tools'**. He explained the flow rates of the groundwater sources exceed the infiltration of rainwater on the surface of the basalts. He hypothesized that the excess flow assumes a lateral supply from the Liasic carbonates reservoir from the neighboring Causes. In the study, he verified his hypothesis through a multidisciplinary approach.

Dr. Abdelkader T. Ahmed, Civil Engineering Department, Faculty of Engineering, Aswan University, Egypt spoke of his research on **'Water Quality and Management of Aflaj in Oman'**. This paper investigates the water quality and management of Aflaj systems in Oman, specifically Al-Hammam Falaj. After taking water samples, results showed that water is suitable for irrigation except on soils with restricted drainage due to the high salinity. He also concluded that human consumption is cautioned and should be monitored regularly to ensure high quality water.

**'Assessment of groundwater quality for drinking and irrigation purposes, Martubah plain, Eastern Libya'** was presented by Dr. Fathi A. Swaid, Director of Research and Engineering Consultants, Man-made River Water Utilization Authority, Middle Region, Libya. Groundwater is the main source of water supply and his research explored the water quality. He found that this water is unsuitable for drinking water and irrigation.

**'Hydrological simulation model at Wadi Alaqiq, Madinah, Saudi Arabia'** was explained by Dr. Norhan Abd Rahman, Department of Civil Engineering, College of Engineering, Taibah University, Kingdom of Saudi Arabia. He conducted research to estimate the flood peak discharge and to evaluate flow characteristics from rainfall-runoff of the Wadi Alaqiq tributaries. He showed how the HEC-HMS model was used in his study to analyze the hydrologic behaviour of the present catchment characteristics.



Mr. Fahad Alahmadi, Land Property Manager, Madinah Water Directorate, Saudi Arabia spoke on the **'Frequency of extreme rainfall of Bathan catchment, Madinah, west of Saudi Arabia'**. The study evaluated the application of maximum annual rainfall series at Wadi Bathan in Madinah based on two rainfall stations. He and his team presented the results they obtained while verifying the best statistical distributions using Anderson-Darling (AD), Kolmogorov-Smirnov (KS), Chi-Squared (CHI).

### **b. Water Management**

**Keynote** - Dr. Senthil Kumar Sadavisam, Assistant Professor, Department of Biotechnology, National College (Autonomous), India spoke about **'Science and Technology for Management of Ground and Surface Water'**. He spoke of India's large consumption of water and how the textile industry is the most polluting putting stress on the quantity and quality of local water resources. Many solutions fail to treat textile wastewater or too expensive, however, there is another option. He uses a coupled biological and advanced oxidation process producing no chemical sludge and wastewater can be re-used for irrigation.

**'Sensitivity Analysis for the Predicted Failure Parameters of Wadi Libda (Liptos) Dam'** was presented by Dr. Salaheddin A. Serra, Civil Engineering Department, University of Tripoli, Libya. His research involves the evaluation of Wadi Libda dam and the possibility of a breach. Using 2 mathematical models he concluded the current system would not provide adequate warning downstream if the dam breaks.

Dr. Thair Al-Taiee, Mosul University, College of Engineering, Dams and Water Resources Engineering Department, Iraq explained the **'Hydrological Benefits in the Context of Cooperating in Constructing Friendship Dams on Transboundary Rivers'**. He highlights the necessity for cooperation on trans-boundary rivers through the means of friendship dams. He mentions several trans-boundary river countries around the world where they have seen benefits on both sides. Furthermore, he emphasizes that these case studies would provide guidance for other countries and facilitate in negotiations.

**'Protection Works against Erosion: The Wadis of Abu-Aisha, Libya'** was presented by Dr. Abduljawad M. Abduljawad, University of Tripoli, Libya. He explained that wadis, a dry riverbed or valley, cause problems to farmers when it floods. This study involves developing a work plan to protect against erosion and the Abu-Aisha agriculture project. He concluded that Rock Riprap should be used due to its availability of materials and ease of construction and maintenance.

Dr. Omolani Mohammad Reza Pour, Assistant Professor, Department of Water Engineering, Faculty of Water & Soil Eng, University of Zabol, Iran explained **'Application of a Max-Min Ant System Algorithm for Optimal Operation of Multi - Reservoirs (Case study: Golestan and Voshmgir Reservoir Dams)'**. This study examines the optimum operation of multi-reservoir systems. He



mentions the solution is to determine the monthly releases of the reservoirs and the optimum allocations of the agricultural demand areas.

### **c. Water Pollution**

**Keynote** – Prof. Dr. Selçuk Soyupak, Chair of Civil Engineering Department, KTO Karatay University-Konya, Turkey presented on **‘A review on Utilization of Artificial Neural Networks for Management of Free Residual Chlorines in Water Distribution Systems’**. He spoke in detail the processes of AAN and DSSs models to control the FRC in water distribution systems. He concluded that managing chlorine levels is vital to keep FRC at appropriate levels.

Dr. Firdes Yenilmez, Akdeniz University, Department of Environmental Engineering, Antalya, Turkey, highlighted the **‘Evaluation of Pollution Control Alternatives to Improve the Water Quality in Porsuk Dam Reservoir’**. She began with explaining the components of eutrophication, more specifically in the Porsuk Dam Reservoir. In her study, she utilized WASP to evaluate pollution control alternatives used to improve water quality. This model was used to predict the future quality conditions, the best result was a 60% reduction in pollution loads.

**‘Pollution Investigation on Tigris River Within Mosul Area’** was presented by Prof. Muath H. Mustafa Alsultan, University of Mosul, Iraq. He evaluated the Tigris water quality regarding its eutrophication and salinity. It was found that the salinity levels have increased 4 times during the last 40 years. To overcome eutrophication and salinity, he recommended wastewater be treated to international standards, apply natural remediation, and buffalo should be relocated away from the river.

**‘Wastewater treatment plant sludge conditioning feasibility using prickly pear cactus juice’** was presented by Prof. Ali Aouabed, Laboratory of Functional Analyses of Chemical Process, Industrial Chemistry Department, Saâd Dahlab University of Blida, Algeria. He informed us that sludge from wastewater treatment is an issue and his work is aimed to study a local plant, *Opuntia ficus indica* juice, to treat the sludge. He concluded the juice increases the dryness of the sludge, causes a good separation of solids and liquids and has the potential to be the basis for new green technology.

Dr. Ykhlef Laidani, Chlef University, Algeria presented on the **‘Kinetics and Thermodynamics of Phenol Adsorption on Luffa Cylindrica Fibers from Aqueous Solution’**. Her research is to find effective solutions to absorb toxic effluents from industrial processes. Through a series of experiments with Luffa Cylindrical, a natural material, she found absorption capacity is influenced by various parameters such as temperature and concentrations used. More research can be done on improving its performance.

**‘Ability of Cords Luffa Cylindrica to Removal Copper ions from Aqueous Solution-Kinetic and Equilibrium Study’** was presented by Dr. Ghania Henini, Laboratory Environment-Water, Hassiba Ben Bouali University, Algeria. In coordination of Dr. Ykhlef Laidani’s research, Dr. Ghania showed that it is possible to



use cords luff cylindrical absorbents for the removal of copper from aqueous solutions.

Jamal Y. Al-Dadah, Palestinian Water Authority, Head of Planning Department, Co-Director of Austrian Project, Palestine explained **'Enhancing Institutional and Legal Framework for Wastewater Reuse Sector in Palestine'**. He mentions the pitfalls of schemes when donors vanish and the hazy framework in coordination. The preferred option is to establish an independently operating Treated Wastewater Distribution Utility which would allow for each stakeholder to have a role.

Mr. Selami Kara, Department of Environmental Engineering, Faculty of Engineering, Akdeniz University, Antalya, Turkey presented on **'Real Time Monitoring of Water Distribution Networks for Safe and Sufficient Water to the Consumers in Antalya City'**. He spoke in detail of monitoring requirements and compared conventional monitoring and real time monitoring. Then he gave first-hand experiences of Antalya's RTM system. He concluded that RTM provides great support to water utilities by reduces water losses and act as an early warning system to protect from adverse impacts.

**'Some System Identification Based Dynamic Models for Predicting Chlorine Concentrations in Water Distribution Networks'** was presented by Prof. Dr. Habib Muhammetoglu, Department of Environmental Engineering, Faculty of Engineering, Akdeniz University, Antalya, Turkey. He spoke of the two types of water losses, physical and commercial. To overcome these losses he recommends using SCADA system, pressure management, and replacing old less accurate customer water meters with new more accurate ones that can reduce water losses significantly.

## vi. Other Events

**'Water Cost Recovery Issues in Libya (Water pricing)'** was moderated by Mr. Bence Fulop from Trinity Kornyeztetvedelem, Hungary on 14 May. Dr. Khaled Rashed explained the current situation in Libya including very low prices, very low efficiency and high consumption of water, and no monitoring system to track consumption. However, there are social and political issues such as weak governance of the water sector that inhibit water sustainability. Discussions followed of solutions of water pricing in Libya. One suggestion was to first show the economic valuation then factor in the social and political aspects. Another is to have a 3<sup>rd</sup> party regulator for water pricing. There was an overwhelming agreement of providing education and awareness to all stakeholders and promote partnerships within communities.

**'Looking for water technologies in the ocean of patent documents - introduction in patent search'** was presented on 14 May by Ms. Irene Kitsara, Project Officer in the Patent Information Section of the World Intellectual Property Organization (WIPO). She explained there are 36 million patents related the 'ocean' showing information regarding their technical, business and legal aspects that can



benefit decision makers. 'WIPO Green' is a database and network to promote the innovation and diffusion of green technologies that should be utilized.

**Future cooperation and partnerships: research and public-private partnerships. The management of total water losses in water distribution networks an application to Antalya City. On May 14 (was same time as Irene's - need summary).**

'**Water Resources in Iraq**' was presented on 15 May. According to the presentation, marshlands are very important to southeastern Iraq for various reasons including economic resources, cultural and historical heritage, a climatic indicator, and biodiversity. However, the marshlands are being drained because of the situation between the government and the opposition. A drained marshland causes wastelands and displacement which is detrimental to the society and environment. To overcome these issues, restoration of these marshes is required. The achievements to date include economic, social and environmental rehabilitation, preservation of heritage sites, the classification of as a national park and Ramsar site, *Wetlands of International Importance*. While these achievements are celebrated, there are still challenges to overcome including the quality and availability of water, basic services, legislation and institutional frameworks, institutional coordination and inexperience.

## **vii. Poster Presentations**

**Improving soil conservation through an adapted tillage: experience from the cultivation of potatoes in Bamiléké's hills of Cameroon.** Mr. Henri Grisseur Djoukeng, University of Liège Gembloux Agro Bio Tech, Department of Science and Environmental Technology, Soil-Water Systems Unit, Gembloux, Belgium.

**The Impact of Environmental Management Plan on Firms' compliance with Environmental Laws.** Ms. Hlamulo Makelane, Human Sciences Research Council, South Africa.

**State of water resources in the Wilaya of Mascara.** Ms. Khadidja Semari, Department of Hydraulics, Faculty of Sciences and Technology, University of Mascara, Algeria

**Comparison of Heavy Metal Adsorption form Carbons Activated with Zinc Chloride Salt (A case study of Cassava and Bamboo biomass).** Ms. Opololaoluwa Ijaola, Department of Agricultural and Environmental Engineering, Faculty of Technology, University of Ibadan, Ibadan Nigeria.

**La Vallee d'Oued Righ (Algerie):Degradation des Palmeraies par les Eaux Usees.** Dr. Samia Benguergoura Laradj, Department of Chemistry, Faculty of Sciences, University of Saad Dahlab Blida, Algeria.



**Wind Energy for Sea Water Desalination in the West of Algeria.** Mr. Belkacem Absar, Science and Technique Laboratory, Science and Technology Faculty, University of Mostaganem, Algeria.

## V. Recommendations

*(Short introductory paragraph)*

### ICWRE - 2014 Conference Recommendations

*(Need list of recommendations from committee)*

## VI. ICWRE - 2014 Award

The winners of the **ICWRE - 2014 Award** were announced at the Final Session of this Conference. This award recognizes the best papers presented during the Conference. The authors of the best papers were given a memorable ICWRE - 2014 plaque and given the distinction as 'Invited Participant' for next ICWRE Conference. The ICWRE - 2014 winners were:

**Dr. Firdes Yenilmez**, Akdeniz University, Department of Environmental Engineering, Antalya Turkey for "Evaluation of Pollution Control Alternatives to Improve the Water Quality in Porsuk Dam Reservoir".

**Mr. Candra Samekto**, School of Agriculture and Food Science, University of Queensland, Australia for "Snowballing State-Private-Society Collaboration in Addressing IWRM Initiation Challenges".

## VII. Conference Organization Committee

- Higher Committee: Dr. Nidal Salim, Prof. Dr. Bülent Topkaya, and Mr. Didier Barth
- ICWRE 2014 Scientific Committee: Dr. Najm Obaid Salim Alghazali, Dr. Mahmoud Bouzelboudjen, Dr. Márk Honti, Dr. Kamal Mohammedi, Dr. Habib Muhammetoglu, Dr. Khalid Qahman, Dr. Khaled Rashed, and Dr. Senthil Kumar Sadasivam
- Akdeniz University
- GIWEH Staff: Mr. Shadi Abu-Harthieh, Mr. Didier Barthe, Ms. Laeka Barthe, Mr. Mohamed Daoud, Ms. Kimberly McLeod, Ms. Elina Mirzoeva, Ms. Tiziana Rizzo, and Ms. Alice Tomaselli

## VIII. Acknowledgements

The Global Institute for Water, Environment and Health (GIWEH) would like to express its appreciation to all members of the ICWRE 2014 Scientific Committee and the Higher Committee.





The GIWEH would also like to express its sincere thanks and appreciation to the partner of the conference - Akdeniz University (Antalya, Turkey) - and especially Prof. Dr. Habib Muhammetoglu for his vital help in making this conference happen.

The GIWEH would like to acknowledge great efforts of its staff members in organizing and facilitating the ICWRE 2014, namely: Mr. Shadi Abu-Harthieh, Mr. Didier Barthe, Mr. Mohamed Daoud, Ms. Kimberly McLeod, Ms. Elina Mirzoeva, Ms. Tiziana Rizzo, Ms. Alice Tomaselli, and Dr. Nidal Salim.

Special thanks are also extended to all authors who submitted papers for the conference and the participants who attended the conference in Antalya. The ICWRE 2014 would not been possible without the commitment and dedication of all above mentioned specialists.



## Appendix I: Conference Agenda

Day 1 – 13 May 2014	
09.30 – 10.30	<p><b>Opening Session</b></p> <ul style="list-style-type: none"> <li>• <i>Mr. Didier Barthe, President of GIWEH – Global Institute for Water, Environment and Health</i></li> <li>• <i>Prof. Mohamed Abdulrazzak, Head, ICWRE 2014 Scientific Committee</i></li> <li>• <i>Prof. Dr. Feramuz Özdemir, Dean of the Faculty of Engineering, Akdeniz University</i></li> <li>• <i>Prof. Dr. Abdullah Aziz Ergin, Vice-Rector of Akdeniz University</i></li> <li>• <i>Dr. Nidal Salim, Chairman of the conference, Director, GIWEH – Global Institute for Water, Environment and Health</i></li> <li>• <i>Mr. Faruk Karaçay, General Director of Antalya Water and Wastewater Administration (ASAT) (tbc)</i></li> <li>• <i>Mr. Menderes Mehmet Tevfik Türel, Mayor of Antalya Metropolitan Municipality (tbc)</i></li> </ul>
10.30 – 11.00	<i>Coffee break</i>
11.00-12.30	<b>Session I – Integrated Water Resources Management and Water Governance (each presentation 15min)</b>
11:00-11:15	<b>Keynote speech – Madame Shuroq Al-Abayachi, Director Water Resources - Ministry of water- Iraq Water Governance in Iraq.</b>
11:15-11:30	<i>Making Water Governance Real (Metropolitan Water Governance, Specific to Istanbul Metropolitan). Ms. Huriye Incecik Ceylan, Expert, Ministry of Forestry and Water Affairs, Directorate General for Water Management, Turkey</i>
11:30-11:45	<i>Snowballing State-Private-Society Collaboration in Addressing IWRM Initiation Challenges. Mr. Candra Samekto, School of Agriculture and Food Science, University of Queensland, Australia.</i>
11:45-12:00	<i>Water Sector Management via AWRM Approach in Countries of the Arabian Peninsula. Prof Mohamed Abdulrazzak, Department of Civil Engineering, Taibah University , Medina , Saudi Arabia.</i>
12:00-12:15	<i>Water Resources Management Practices in the Sultanate Oman. Eng. Ahmed Al Barwani, Water Resources Expert, Ministry of Regional Municipalities and Water Resources, Sultanate of Oman</i>
12:15-12:30	<b>Discussion</b>
12.30-14.00	<i>Lunch</i>
14.00-15.30	<b>Session II– Integrated Water Resources Management (IWRM) and National Water Sector Management</b>



14:00-14:20	<b>Keynote speech – Prof. Abdulgader A. Abufayed, College of Engineering, University of Tripoli, Tripoli, Libya</b>
14:20-14:35	Challenges to the water sector in Jordan: a critical look. <i>Dr. Abbas Al Omari, Associate Researcher, Water, Energy and Environment Centre, University of Jordan, Amman, Jordan.</i>
14:35-14:50	A Multidisciplinary Partnership to support Water Resources Management in Cabo Delgado: stakeholder’s participation as a key factor. <i>Ms. Eva Docampo, Amphos 21 Consulting S.L., Spain</i>
14:50-15:05	Water demand and water pollution in Egypt. <i>Dr. Zeinab Shaaban Abu-Elnaga, Faculty of Science, Mansoura University, Director of MUIRO, Egypt</i>
15:05-15:20	Towards the Implementation of the European Union Water Framework Directive in Turkey. <i>Prof. Dr. Ayse Muhammetoglu Environmental Engineering Dept., Engineering Faculty, Akdeniz University, Turkey</i>
15:20-15:30	<b>Discussion</b>
<b>15:30-16:00</b>	<b>Coffee break</b>
16:00-16:30	<b>Special Session: Water Governance- Role of Water technology</b> Membrane Technology in Water Treatment and Desalination. <i>Prof. Dr Ismail Koyuncu. Head of National Membrane Technologies Research Center. Head of Graduate school of Science Engineering and Technology, Istanbul Technical University</i>
16:30-18:00	<b>Continuation of Session II– Integrated Water Resources Management(IWRM) and National Water Sector Management</b>
16:30-16:45	Contribution of GIS in selecting the favourable site for the location of the station purifying wastewater of Azrou city (Middle Atlas, Morocco). <i>Professor Abdellah El Hmaidi, Moulay Ismail University, Morocco.</i>
16:45-17:00	A Proactive Plan to Improve Urban Water Sector in Libya. <i>Dr. Khaled A. Rashed, Associate Professor, Department of Civil Engineering, Faculty of Engineering, University of Tripoli, Tripoli, Libya</i>
17:15-17:30	Domestic Water Security for Sustainable Development in North Central belt of Nigeria. <i>Mr. Samuel Ibbi Ibrahim, Department of Geography, Faculty of Natural Sciences, Ibrahim Badamasi Babangida University, Lapai, Nigeria.</i>
17:30-17:45	The Management of Urban Water Bodies in Ghana: the case of the Kumasi Metropolis. <i>Dr. David Forkuor, Kwame Nkrumah University of Science and Technology, Department of Geography and Rural Development, Ghana</i>



17:45-18:00	<i>Discussion</i>
<b>Day 2 – 14 May 2014</b>	
09.00 – 10:30	<b>Session III – Enabling Environment for Water Resources Management (each presentation 15 min)</b>
09:00-09:15	<i>Keynote speech- Development of a modular reconfigurable water bag for long distance freshwater transport over the sea: from concept to full-scale demonstration. Mr. Samuele Ambrosetti, Senior Engineer, D’Appolonia SPA, Italy</i>
09:15-09:30	Water Desalination and Water transport. <i>Dr. Salaheddin Shmela, Civil Engineering Department, Tripoli University, Libya</i>
09:30-09:45	A large Scale Seawater Desalination is a Sustainable Option for Gaza Water Supply. <i>Eng. Mahmoud Ismail, Director of National Water Council Unit (Gaza/Palestine), Coordinator of Desalination Project, Palestinian Water Authority</i>
09:45-10:00	Carbon Footprint Assessment of desalination Industry in Algeria. <i>Prof. Kamal Mohammedi, MESO team, ELEM/UMB</i>
10:00-10:15	Role of HANDS to Provide Sustainable Access to WASH Services: A study of Government and Non-Government Schools in Gadap Town Karachi, Sindh, Pakistan. <i>Ms. Rubina Jaffri, General Manager, HANDS Pakistan</i>
10:15-10:30	<i>Discussion</i>
10:30-11:00	<i>Coffee break</i>
11.00-12.30	<b>Session III – Regional Challenges and Opportunities for Water Resources Management (each presentation 15 min)</b>
11:00-11:15	<i>Keynote speech – Urban water sustainable management under climate change conditions: acknowledging its true value, defining its full cost, setting a socially fair price. Dr. Vasilis Kanakoudis, Assistant Professor, Civil Engineering Dept., University of Thessaly, Greece</i>
11:15-11:30	Fundamental Signals of Investment Profitability in the Global Water Industry. <i>Mr. Rajibur Reza, Department of Accounting, Finance and Economics, Griffith University, Australia</i>
11:30-11:45	Sustainable Urban Drainage Recommendation for Future Direction in Rain Water Management in Jordan. <i>Ms. Zain M. Al Hourri ,Civil engineering Department, Applied Science Private University, Amman, Jordan</i>



11:45-12:00	Water Sector in Israel and its Impact on the Palestinian Water. <i>Eng. Mahmoud Ismail, The Palestinian Water Authority, Palestine</i>
12:00-12:15	Water Governance in Georgia. <i>Ms. Nino Abuladze, United Water Supply Company of Georgia, LLC Ministry of Regional Development and Infrastructure of Georgia</i>
12:15-12:30	<b>Discussion</b>
12.30-14.00	<i>Lunch</i>
14.00-15.30	<b>Session IV-Science and Technology-Groundwater Management</b>
14:00-14:20	<b>Key note speech – Mohamed Abdulrazzak, Professor of Water Resources Management ,Civil Engineering Dept .Taibah university ,Medina Saudi Arabia, and Former: Senior UNESCO Regional Director for Cairo office, Egypt and Deputy Executive Secretary , UN-ESCWA ,Lebanon</b>
14:20-14:35	Study of water potential in the Saïss basin and development of a model of integrated management of water resources by the WEAP tools. <i>Prof. Ali Essahlaoui, Research group "Water Science and Environmental Engineering," Laboratory. Geo-engineering and Environmental Geology Department, Faculty of Sciences, Morocco</i>
14:35-14:50	A Simulation/Optimization Approach to Manage Groundwater Resources in the Gaza Aquifer (Palestinian) Under Climate Change Conditions. <i>Dr. Khalid Qahman, Gaza Islamic University and Environment Quality Authority, Palestine</i>
14:50-15:05	Estimating the Effect of Qanats and Underground Dam on Water Levels in Wells, Using Finite Difference Simulation. <i>Mr. Babak Vaheddoost, PhD candidate, Istanbul Technical University/ Department of Civil Engineering, Turkey</i>
15:05-15:20	Modeling of groundwater flow of the aquifer system in the plain of Mléta - Sebkha Basin of Oran (Algeria). <i>Dr. Baghdadadi Boukerma, Hydrology and Water Resources Management Laboratory, Department of hydraulics, University of Science and Technology, Algeria</i>
15:20-15:30	<b>Discussion</b>
15:30-16:00	<i>Coffee break</i>
16:00-18:00	<b>Session IV (continuation) – Science and Technology for Groundwater Management (each presentation 15 min)</b>
16:00-16:15	High Abstraction Impact on the Groundwater Resources on the South Area of Libya. <i>Dr. Almabruk A. Sanoussi, Civil Engineering Department, Tripoli University, Tripoli, Libya</i>
	Revelation of the lateral Mixture between Two Reservoirs at the Level of the



16:15-16:30	Basalt Aquifer of Tigrira (Morocco) by the Hydrogeological and Isotopic Tools. <i>Dr. Abdelhadi El Ouali, Research team "Hydrogeology and Environment", Faculty of Science, University Moulay Ismail, Meknes, Morocco.</i>
16:30-16:45	Water Quality and Management of Aflaj in Oman. <i>Dr. Abdelkader T. Ahmed, Civil Engineering Department, Faculty of Engineering, Aswan University, Egypt</i>
16:45-17:00	Assessment of groundwater quality for drinking and irrigation purposes, Martubah plain, Eastern Libya. <i>Dr. Fathi A. Swaid, Director of Research and Engineering Consultants, Man-made River Water Utilization Authority, Middle Region, Libya</i>
17:00-17:15	Hydrological simulation model at Wadi Alaqiq, Madinah, Saudi Arabia. <i>Dr. Norhan Abd Rahman, Department of Civil Engineering, College of Engineering, Taibah University, Kingdom of Saudi Arabia</i>
17:15-17:30	Frequency of extreme rainfall of Bathan catchment, Madinah, west of Saudi Arabia. <i>Mr. Fahad Alahmadi, Land Property Manager, Madinah Water Directorate, Saudi Arabia</i>
17:30-18:00	<b>Discussion</b>
<b>Day 3 – 15 May 2014</b>	
9.00 – 10.30	<b>Session IV (continuation) – Science and Technology for Water Management (each presentation 15 min)</b>
09:00-9:20	<b>Keynote speech – Dr. Senthil Kumar Sadavisam, Assistant Professor, Department of Biotechnology, National College (Autonomous), India.</b>
09:20-09:35	Sensitivity Analysis for the Predicted Failure Parameters of Wadi Libda (Liptos) Dam. <i>Dr. Salaheddin A. Serra, Civil Engineering Dept., University of Tripoli, Libya</i>
09:35-09:50	Hydrological Benefits in the Context of Cooperating in Constructing Friendship Dams on Transboundary Rivers. <i>Dr. Thair Al-Taiee, Mosul University, College of Engineering, Dams and Water Resources Engineering Department, Iraq</i>
09:50-10:05	Protection Works against Erosion: The Wadis of Abu-Aisha, Libya. <i>Dr. Abduljawad M. Abduljawad, University of Tripoly, Libya</i>
10:05-10:20	Application of a Max-Min Ant System Algorithm for Optimal Operation of Multi – Reservoirs (Case study: Golestan and Voshmgir Reservoir Dams). <i>Dr. Omolani Mohammad Reza Pour, Assistant Professor of Department of Water Engineering, Faculty of Water &amp; soil Eng., University of Zabol, Iran</i>
10:20-10:30	<b>Discussion</b>



10:30-11:00	<i>Coffee break</i>
11:00-12:30	<b>Session IV (continuation) – Science and Technology : Water Pollution Control (each presentation 15min)</b>
11:00-11:20	<b><i>Key note speech – A review on Utilization of Artificial Neural Networks for Management of Free Residual Chlorines in Water Distribution Systems. Prof. Dr. Selçuk Soyupak, Chair of Civil Engineering Department, KTO Karatay University-Konya, Turkey</i></b>
11:20-11:35	Evaluation of Pollution Control Alternatives to Improve the Water Quality in Porsuk Dam Reservoir. <i>Dr. Firdes Yenilmez, Akdeniz University, Department of Environmental Engineering, Antalya, Turkey</i>
11:35-11:50	Pollution Investigation on Tigris River Within Mosul Area. <i>Prof. Muath H. Mustafa Alsultan, University of Mosul, Iraq</i>
11:50-12:05	Wastewater treatment plant sludge conditioning feasibility using prickly pear cactus ( <i>Opuntiaficusindica</i> ) juice. <i>Prof. Ali Aouabed, Laboratory of Functional Analyses of Chemical Process, Industrial Chemistry Department, Saâd Dahlab University of Blida, Algeria</i>
12:05-12:20	Kinetics and Thermodynamics of Phenol Adsorption on Luffa Cylindrica Fibers from Aqueous Solution. <i>Dr. Ykhlef Laidani, Chlef University, Algeria</i>
12:20-12:30	<b><i>Discussion</i></b>
12:30-14:00	<i>Lunch break</i>
14:00-15:00	<b>Session IV (continuation) – Science and Technology : Water Pollution Control (each presentation 15min)</b>
14:00-14:15	Ability of Cords Luffa Cylindrica to Removal Copper ions from Aqueous Solution-Kinetic and Equilibrium Study. <i>Dr. Ghania Henini, Laboratory Environment-Water, Hassiba Ben Bouali University, Chlef, Algeria</i>
14:15-14:30	Enhancing Institutional and Legal Framework for Wastewater Reuse Sector in Palestine State. <i>Eng. Jamal Y. Al-Dadah, Palestinian Water Authority, Head of Planning Department, Co-Director of Austrian Project, Palestine</i>
14:30-14:45	Real Time Monitoring of Water Distribution Networks for Safe and Sufficient Water to the Consumers in Antalya City. <i>Mr. Selami Kara, Department of Environmental Engineering, Faculty of Engineering, Akdeniz University, Antalya, Turkey</i>
14:45-15:00	Some System Identification Based Dynamic Models for Predicting Chlorine Concentrations in Water Distribution Networks. <i>Prof. Dr. Habib Muhammetoglu, Department of Environmental Engineering, Faculty of Engineering, Akdeniz University, Antalya, Turkey</i>



15:00-15:15	<b>Discussion</b>
15:15 -15:45	<i>Coffee break</i>
15:45 – 16:30	<b>Results and Recommendations</b>
<b>16:30</b>	<b>Closing</b>

**Side events, workshops and roundtable discussions**

**14 May: Day 2**

10:00 – 12:00 *Water Cost Recovery Issues in Libya- (Water pricing)*

- Moderator – Mr. Bence Fulop, Trinity Környez etvédelem, Hungary

14:00 – 17:00 Workshop on “*Looking for water technologies in the ocean of patent documents - introduction in patent search*”

- Moderator: Ms. Irene Kitsara, Project Officer, Patent Information Section, World Intellectual Property Organization (WIPO)

1. Introduction to IP Rights and to the patent system
2. Patent Information and its added value
3. Basics of patent search: resources and search methodology
4. Practical examples: how to search for patents in water-related technologies

**15 May: Day 3**

10:00 – 12:00 *Roundtable discussion “Future cooperation and partnerships: research and public-private partnerships”* Management of Total Water Losses in Water Distribution Networks: Application to Antalya City.

- Prof. Dr. Habib Muhammetoglu, Department of Environmental Engineering, Faculty of Engineering, Akdeniz University, Antalya, Turkey
- Dr. Vasilis Kanakoudis, Assistant Professor, Civil Engineering Dept., University of Thessaly, Greece
- Mr. Ibrahim Ethem Karadirek, Department of Environmental Engineering, Faculty of Engineering, Akdeniz University, Antalya, Turkey





- ***Panel Discussion of experts on the issues of Integrated Water Resources Management (WRM) and the Enhancement of Water Governance.***
- ***Special Roundtable Discussion, Water Resources in Iraq- Water and Energy. Time to be determined on 13<sup>th</sup> May.***



## Appendix II: List of Participants

<b>Title</b>	<b>First name</b>	<b>Last Name</b>	<b>Postition; Organization</b>	<b>Country</b>
Dr.	Norhan	Abd Rahman	Department of Civil Engineering ; College of Engineering, Taibah University, Kingdom of Saudi Arabia	Malaysia
Mr.	Shadi	Abu-Harthien	Staff; GIWEH	Switzerland
Ms.	Nino	Abuladze	United Water Supply Company of Georgia, LLC, Ministry of Regional Development and Infrastructure of Georgia	Georgia
Ms.	Rana Abdulhadi	Abdulameer	Ministry of Water; Iraq Water Governance	Iraq
Dr.	Abduljawad	Abduljawad	University of Tripoli, Libya	Libya
Mr.	Mohammad	Abdulla	Ministry of Environment; Oman	Oman
Dr.	Mohamed	Abdulrazzak	Professor of Water Resources Management; Civil Engineering Dept. Taibah University, Medina Saudi Arabia	Libya
Mr.	Belkacem	Absar	Laboratoire Sciences et Techniques de Valorisation, Faculté des Sciences et de la technologie, Université de Mostaganem, Algeria	Algeria
Dr.	Zeinab	Abou-Elnaga	Associate Professor; Faculty of Science - Mansoura University	Egypt
Mr.	Murtala	Abubakar Gada	Department of Environmental Science and Technology; Cranfield University, UK	Nigeria
Prof.	Abdulgader A	Abufayed	College of Engineering; University of Tripoli, Tripoli, Libya	Libya
Dr.	Abdelkader T.	Ahmed	Faculty of Engineering; Civil Engineering Department, Aswan University, Egypt	Egypt
Ms.	Shagufta	Akbari	Research Scholar; Department of Civil Engineering, Indian Institute of Technology, Powai, Mumbai, Maharashtra, India	India
Mr.	<b>Ahmad</b>	<b>Al-Abri</b>		Oman
Mme.	Shuroq	Al-Abayachi	Director of Water Resources; Ministry of Water, Iraq Water Governance	Iraq
Eng.	Hassan bin Yousuf bin Murad	Al Balushi	Ministry of Environment; Oman	Oman



Eng.	Ahmed	Al Barwani	Water Resources Expert; Ministry of Regional Municipalities and Water Resources, Sultanate of Oman	Oman
Mr.	Fahad Salim	Alahmadi	Land Property Manager; Madinah Water Directorate, Saudi Arabia	Saudi Arabia
Mr	Moftah Ali	Aldawe	UnderSecretary - Ministry of Water Resources	Libya
Eng.	Jamal Y.	Al-Dadah	Palestinian Water Authority; Head of Planning Department, Co-Director of Austrian Project, Palestine	Palestine
Mr.	Luay A. Hussein	Al-Daloo	Ministry of Water; Iraq Water Governance	Iraq
Ms.	Zain M.	Al Hourri	Civil Engineering Department; Applied Science Private University, Amman, Jordan	Jordan
Dr.	Fathi	Ali Swaid	Director of Research and Engineering Consultants; Man-made River Water Utilization Authority, Middle Region, Libya	Libya
Ms.	Athil Khalid Mahmood	Alkhaled	Ministry of Water; Iraq Water Governance	Iraq
Dr.	Abbas	Al-Omari	Associate Researcher; Water, Energy and Environment Centre, University of Jordan, Amman, Jordan	Jordan
Prof.	Thair	Al-Taiee	Dams and Water Resources Engineering Department; College of Engineering, Mosul University, Iraq	Iraq
Mr.	Samuele	Ambrosetti	Senior Engineer; D'Appolonia SPA, Italy	Italy
Prof.	Ali	Aouabed	Laboratory of Functional Analyses of Chemical Process; Industrial Chemistry Department, Saad Dahlab University of Blida, Algeria	Algeria
Mr.	Didier	Barthe	President; GIWEH	Switzerland
Ms.	Leika	Barthe	Staff; GIWEH	Switzerland
Dr.	Samia	Benguergour a Laradj	Department of Chimi, Faculty of Sciences, University Saad Dahlab Blida, Algeria	Algeria
Eng.	Amal	Ben Issa	Head of Planning Department; Senior Eng.; Engineering Consultant Office for Utilities (ECOU)	Libya
Mr.	Djamal	Boudieb	MESO nexusteam; LEMI, M Bougara University, Boumerdès	Algeria



Dr.	Baghdadi	Boukerma	Hydrology and Water Resources Management Laboratory; Department of Hydraulics, University of Science and Technology, Algeria	Algeria
Mr.	Abdelkader	Bouziane	MESOnexusteam; M Bougara University	Algeria
Ms.	Huriye Incecik	Ceylan	Expert; Ministry of Forestry & Water Affairs, Director General for Water Management	Turkey
Eng.	Olivier	Debauche	PhD student; Gembloux Agro-Bio Tech University of Liege	Belgium
Eng.	Henri Grisseur	Djoukeng	University of Liege Gembloux Agro Bio Tech, Belgium	Cameroon
Eng.	Eva	Docampo	Amphos 21 Consulting S.L. Spain	Spain
Prof.	Mohammed	El Bastawesy	Geological Application Division of the National Authority for Remote Sensing and Space Sciences (NARSS) Cairo, Egypt	Egypt
Mr.	Mohamed Jalal	El Hamidi	PhD. Student; Mohammadia School of Engineers	Morocco
Prof.	Abdellah	El Hmaidi	Moulay Ismail University, Morocco	Morocco
Prof.	Abdelhadi	El Ouali	Research Team 'Hydrology and Environment'; Faculty of Science, University Moulaz Ismail, Meknes, Morocco	Morocco
Eng.	Nuri Mohamed	El Ramalli		Libya
Mr.	Sofian	Eltreki	First Secretary; International Organizations Department, Ministry of Foreign Affairs & International Cooperation - State of Libya	Libya
Prof.	Ali	Essahlaoui	Research Group 'Water Science and Environmental Engineering'; Laboratory. Geo-Engineering and Environmental Geology Department, Faculty of Sciences, Morocco	Morocco
Mr.	Moatamed	Essanousi		Libya
Eng.	Fathi Alamer	Ewaz	Head of the Department of Pollution; Environmental General	Libya
Mr.	Roger	Feumba	PhD Student; University of Yaounde I	Cameroon
	Musondu	Flugna Flore		Cameroon



Dr.	David	Forkuor	Kwame Nkrumah University of Science and Technology, Department of Geography and Rural Development, Ghana	Ghana
Mr.	Bence	Fulop	Director; Trinity Kornyez	Hungary
Eng.	Mohammed	Hardan	Head of Soil, Water Pollution and Waste Management Section; Ministry Of Environment and Climate Affairs	Oman
Dr.	Ghania	Henini	Laboratory Environment Water; Hassiba Ben Bouali University, Chlef, Algeria	Algeria
Eng.	Karima	Hussein	Senior Engineer; Engineering Consultant Office for Utilities (ECOUI)	Libya
Dr.	Samuel Ibbi	Ibrahim	Faculty of Natural Sciences; Department of Geography, Ibrahim Badamasi Babangida University, Lafia, Nigeria	Nigeria
Mr.	Moussa	Ibrahim	WASCAL Graduate Research Programme; Climate Change and Water Resources, University of Abomey-Calavi, Cotonou, Benin	Niger
Dr.	Philipa O.	Idogho	The Rector, Auchi Polytechnic, Auchi, Nigeria	Nigeria
Ms.	Opololaoluwa	Ijaola	Faculty of Technology; Department of Agricultural and Environmental Engineering, University of Ibadan, Ibadan Nigeria	Nigeria
Eng.	Mahmoud	Ismail	Director; National Water Council Unit (Gaza/Palestine), Coordinator of Desalination Project, Palestinian Water Authority	Palestine
Ms.	Rubina	Jaffri	General Manager; HANDS Pakistan	Pakistan
Dr.	Hatem	Jemmali	Assistant Professor; Research Laboratory in Quantitative Economics and Development	Tunisia
Dr.	Vasilis	Kanakoudis	Assistant Professor; Civil Engineering Department, University of Thessaly, Greece	Greece
Eng.	Selami	Kara	Research Assistant; Akdeniz University	Turkey
Mr.	Ibrahim Ethem	Karadirek	Research Assistant; Akdeniz University	Turkey
Ms.	Lisana	Karomah	Student; University of Indonesia	Indonesia
Ms.	Irene	Kitsara	Project Officer; Patent Information	Switzerland



			Section, World Intellectual Property Organization (WIPO)	
Prof.Dr	Ismail	Koyuncu	Head of National Membrane Technologies Research Center; Head of Graduate School of Science Engineering and Technology, Istanbul Technical University	Turkey
Dr.	Ykhlef	Laidani	Chlef University Algeria	Algeria
Ms.	Allison	Lutz	College Professor; Selkirk College	Canada
Ms.	Hlamulo	Makelane	Researcher; Human Sciences Research Council	South Africa
Dr.	Varduhi	Margaryan	Yerevan State University; Yerevan, Armenia	Armenia
Dr.	Majid	Mathlouthi	Laboratoire de Recherche en Sciences et Technologies de l'Eau à l'INAT	Tunisia
Ms.	Kimberly	McLeod	Staff; GIWEH	Switzerland
Ms.	Elina	Mirozoeva	Staff; GIWEH	Switzerland
Dr.	Omolbani	Mohammad Reza Pour	Assistant Professor; Department of Water Engineering, Faculty of Water & Soil Eng., University of Zabol, Iran	Iran
Prof.	Kamal	Mohammedi	Lecturer; MESOnexusteam, M Bougara University	Algeria
Prof.	Ayşe	Muhammeto ğlu	Engineering Faculty; Environmental Engineering Department, Akdeniz University, Turkey	Turkey
Prof.	Muath	Mustafa Alsultan	Lecturer; University of Mosul, Iraq	Iraq
Mr.	Ghulam	Mustafa	General Manager; HANDS Pakistan	Pakistan
Prof.	Khaled	Oun	Chairman; Board of Directors, General Water Authority, Libya	Libya
Prof.Dr	Feramuz	ÖZDEMİR	Dean of the Faculty of Engineering; Akdeniz University	Turkey
Dr.	Khalid	Qahman	Gaza Islamic University and Environmental Quality Authority; Palestine	Palestine
Dr.	Khaled A.	Rashed	Associate Professor; Department of Civil Engineering, Faculty of Engineering University of Tripoli Tripoli, Libya	Libya
Mr.	Rajibur	Reza	Department of Accounting, Finance and Economics; Griffith University, Australia	Australia
Ms.	Tiziana	Rizzo	Staff; GIWEH	Switzerland
Mr.	Nirav	Sadariya	Undergraduate student; Pandit	India



			Deendayal Petroleum University, India	
Dr.	Senthil Kumar	Sadasivam	Assistant Professor; National College (Autonomous), Tiruchirapalli, Tamil Nadu, India	India
Dr.	Nasser A.	Sahli	Water Quality Consultant; Man- made river, Libya	Libya
Prof.	Zineb	Salem	University of Science and Technology Houari Boumediene	Algeria
Dr.	Nidal	Salim	Executive Director; GIWEH	Switzerland
Mr.	Candra	Samekto	School of Agriculture and Food Science; University of Queensland, Australia	Indonesia
Ms.	Sellam	Samira	Ministry of Water Resources, Algeria	Algeria
Dr.	Almabruk A.	Sanoussi	Civil Engineering Department; Tripoli University, Tripoli, Libya	Libya
Eng.	Andreas Paul	Schmidt	Head of Center of Competence Water Supply; CSD Engineers	Switzerland
Ms.	Khadidja	Semari	Department of Hydraulics; Faculty of Sciences and Technology, University of Mascara, Algeria	Algeria
Dr.	Salaheddin A.	Serrag	Civil Engineering Department; Tripoli University, Libya	Libya
Mr.	Ahmed Hameed	Shihab	Ministry of Water; Iraq Water Governance	Iraq
Dr.	Salaheddin	Shmela	Civil Engineering Department; Tripoli University, Libya	Libya
Prof.Dr .	Selcuk	Soyupak	Professor, Doctor; KTO Karatay University (Chairman), Department of Civil Engineering	Turkey
Dr.	Jean Ghislain	Tabue Youmbi	Researcher; University of Yaounde I	Cameroon
Dr.	Nouar	Tahar	Research Professor;	Algeria
Ms.	Quy	Thi Ngoc Dinh	Master; Hue University Vietnam	Vietnam
Mr.	Babak	Vaheddoost	PhD Candidate; Istanbul Technical University/Department of Civil Engineering, Turkey	Iran
Dr.	Firdes	Yenilmez	Research Assistant; Akdeniz University	Turkey
Mr.	Donato	Zangani	D'Appolonia SPA, Italy	Italy
Dr.	Masoud Moustafa	Zatout	Head of Department of Biological; Omar Al-Mokhtar University	Libya
Eng.	Hanan	Zawia	Head of Planning Department; Engineering Consultant Office for	Libya



			Utilities (ECOU)	
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## Appendix III: Keynote Speeches

### **Mr. Didier Barthe - President of GIWEH**

“Excellences, representatives of countries and UN Organizations, professors, researchers and academics, distinguished delegates and speakers. Dear participants, I am very pleased to announce the official opening of the Third International Conference of Water and Environment 2014 in Antalya. I will start by thanking all of you for joining this third edition of the conference.

Water is one of the most important natural resources which is rooted to power, politics, socioeconomic and environmental aspects. Today, the world suffers from severe water problems caused by global changes including population growth, migration, rapid urbanization and climate change. This will directly influence food security, health, economic growth, and poverty elevation.

You are the promise of the future and leaders to be and are working on a daily base of this limited resource at different levels. This series of conferences is a real challenge for you to look for innovation, solutions and improve governance. Solutions are available at different scales but it need to be managed and disseminate in the right way.

Again welcome to all of you in Antalya and wishing you all a nice stay and a successful conference.”

### **Gürhan YALÇIN - Vice-Dean of the Faculty of Engineering, Akdeniz University**

“Hello distinguished guests, good morning and welcome to Antalya. We are very pleased to host the 3<sup>rd</sup> International Conference of Water Resource and Environmental Management: The role of governance in the management of water resource and environment.

As we all know, water resources are getting scarce and we all have to work for sustainable management of water. I believe that this conference will be able to be platform to share experiences of many different countries which face real water quality and quantity problems. I am also a geological engineer and in our disciplines we are also very much related to issues of water.

I wish you all a very successful conference and hope that you will benefit from the outcomes of this conference, as well. On behalf of the Dean of Faculty of Engineering at Akdeniz University, I wish you a happy and enjoyable stay in Antalya.”



## Appendix IV: Dr. Salim's Opening Statement

“Good morning ladies and gentleman, I will start by thanking all of you for being here in Antalya today for the 3<sup>rd</sup> edition of ICWRE. We are in Antalya in this nice city at the Mediterranean Sea. I am glad to see all of you participating with us at this conference.

Water is one source with many different perspectives. Water can be a source of peace. A source of development. A source of life. But it can also be a source of war. A source of dispute. And a source of instability. It is us who creates our future. With cooperation and an open mind we can build our future. We are living in an unstable world; political, social, economic, and environmental aspects. Water is at the core of these main topics. If we do not care; if we do not give more attention and good governance for the water resources; water will be a source of dispute and conflict. This will add more instability in the region.

In the international community the trend is focusing on water security. This is the top agenda for the UN and the World Water Council and the Istanbul World Water Forum. In water security, we have different aspects and themes of water-food-energy nexus and the pressure of change. This is a complex package and need to know how to deal with it.

I would like to speak about the development of the water agenda because 20 years ago water was treated as a natural resource. But now water is a top priority of global governance. In 2002, we started in the UN with the Millennium Development Goals. Water was not presented in the 8 items but water was hidden in all the items and goals. All of the water leaders were fighting to put the water agenda at the top of the development agenda because if we do not have water, we do not have development. If we do not manage our water resources in a good way, we will not have sustainability.

In 2010, we had the first declaration as water as a basic human right at the United Nations. This was a very big achievement in the UN. In 2012 at Rio+20, we fought with water scientists and water policy makers to put water in the agenda. It was highlighted as one of the themes to be in the development agenda. We had a commitment from the Secretary General, Mr. Ban Ki-moon, to put water in the top priority. In 2013, we have the continuation of Rio+20 and the Budapest Water Summit where Mr. Bank Ki-Moon came himself. He transferred his words into commitments and he announced in Budapest that water must be in the development agenda and he supported all the water researchers, academia, and governments working in this field. In Budapest, we have water as highlighted in the topics of the development.

Now in 2014, we are trying to prepare and finalize as an international community the Post-2015 agenda. There were 100 items and tried to decrease to 30. Now in the final draft of the development agenda, we have achieved water as one item to be presented in the development agenda. It will be the 6<sup>th</sup> item. The draft was accepted by the Secretary General. I think for the next 10 years, water will be at the top priority along with poverty reduction, empowerment women and children



and other activities like sustainability. And water will be one of these main topics. In the next 10 years, in the international agenda, water will be very much highlighted. And each country, each government, each institution have to start moving and start building policy and strategies. Because this is the index of the development of the country. If you would like to see your country developing in the right way you have to work on the water because it is the foundation.

One of the main objectives of this conference is to build networks. Try to discover the needs of countries, help them to adopt the UN agenda for water development, try to see these countries especially, the developing countries and the Arabic Countries where I am coming from, to see these countries go up in index of water development. We would like to achieve sustainability and we would like to achieve development.

I will speak about the history of this conference. This conference started with a small initiative at the UN on World Water Day 2009 called 'Water For Leadership'. At that time, we had all the UN organizations presenting to us in Geneva; the World Health Organization, World Meteorological Organization, UN Environmental Program, and the headquarters of the UN. There we announced GIWEH's own good practices for water. In 2009, South Korea was the winner of the GIWEH award for their project on the green economy. They received a stimulus package for the financial crisis and voted 87 billion dollars to be used on the green economy and 32 billion dollars for water security. In 2010, we highlighted water politics and trans-boundary water resources management. We gave the award to France and Switzerland, respectively, for their good cooperation of water resource management in trans-boundary areas. In 2012, we made a shift in the program, focusing on youth and academic leaders. The winners of the GIWEH award were Princess Dr. Mahael Bint Muhammad Bin Saud Bin Abdurrahman Al Saud from Saudi Arabia for her efforts in empowering women and youth, and two youth; Ms. Emel Zerrouk from the UK and Ms. Yana Nazarova from Russia. In 2013, 'ICWRE: Water, Food, Energy Security' was held in Geneva and the two winners of the GIWEH award for best research were Dr. Khaled Qahman from Palestine and Dr. Senthil Kumar from India.

The main objective of this conference is to bridge the gap between science and policy making. Each party have different languages. We would like to discover how to understand each other because policy making cannot be done without a good solid technical research - technical research coming from science. Science is the main supporter for the decision making. We would like to develop this relationship between scientists and governments. Once we work with the scientists there is a flaw for innovation and creation. This is a very big trend where we are trying to develop and to see how we can be innovated in water resources. We have a partnership with WIPO who will make a presentation tomorrow to let you know how to register patents concerning water and wastewater. This innovation is not only solid, innovation can be in ideas. If anyone has good ideas, please feel free to contact us. We can develop the ideas, we can develop a project, and we can link you to other organizations in Europe.



To build this type of relation, we need to look at the needs and requirements for each one of you. We are arriving to have various Memorandum of Understandings with the State of Iraq, Libya and Palestine. We are helping them and they are helping us to develop the water sector in their country and to put them at top positions in the development process to be connected to the United Nations and Swiss organizations and universities in order to develop their research and the scientific careers.

We would like to thank our friends and colleagues in Turkey for hosting our conference. We linked to Akdeniz University at the last two months and we would like to thank them very much for helping us organize this conference in Antalya, the city which we all like. We wish you all great success in this conference. We are here to cooperate with you and we would like to develop ideas and cooperation and further our collaborations in the future. I would like to welcome you again in your country - our country - and after the break we will start the official scientific opening.”