



International Conference on  
Water Resources & Environmental Management

## **Report**

### **Second International Conference on Water Resources and Environmental Management: “Water, Food, Energy Security and Climate Change” (ICWRE-2013)**

**International Conference Center of Geneva (CICG), Switzerland  
9<sup>th</sup>-11<sup>th</sup> April 2013**



## I. Introduction

The Global Institute for Water, Environment, and Health (GIWEH) in response to increasing water scarcity, environmental degradation and the United Nations 2013 year of Water Cooperation has organized its Second International Conference for Water Resources and Environmental Management in Geneva, Switzerland. The conference is a follow up of the GIWEH first International Conference organized in Marrakesh Morocco, 20<sup>th</sup> – 24<sup>th</sup> November 2011 under the same title as a series of the Institute's global initiatives.

Water scarcity continues to be experienced in different parts of the world due to natural physical scarcity availability in time and space and induced man-made social-economic activities leading to increased depletion of sources and pollution levels. Water scarcity is further exacerbated by the climate change phenomenon. The different degree of water scarcity in conjunction with competing water demands presents a major challenge to decision makers to meet the accelerated socio-economic development and ecosystem equilibrium requirements and enhance the quality of life for all segments of the society, especially of the poor.

Major contemporary issues facing the Global communities include, but are not limited to:

1. The connection between water, food, energy security and climate change, and its effect on human wellbeing and life;
2. The nexus approach – to integrate management and governance across sectors and scales;
3. Equal access to adequate and safe drinking water supplies and adequate and safe wastewater coverage in line with the MDG objectives;
4. Transboundary water cooperation, water governance and politics;
5. Access to new water technologies and intellectual property;

These priority and emerging issues were debated by decision makers, water and environmental professionals and NGO from different parts of the world.

## II. Organization of Work

In order to contribute to debates taken place at national, regional and international levels, the Global Institute for Water, Environment and Health (GIWEH) has taken the initiative to organize its Second International Conference for Water Resources and Environmental Management titled "Water/Food/Energy Security and Climate Change" (ICWRE-2013) in Geneva, Switzerland. The conference was held at the International Conference Center of Geneva (CICG), Switzerland from 9<sup>th</sup> to 11<sup>th</sup> April 2013. The conference was organized in collaboration with the UNESCO-IHE Institute for Water Education, the Ecole Mohammadia d'Ingénieurs, the World Intellectual Property Organization (WIPO), the United Nations Food and Agriculture Organization (FAO), the University of Geneva, the Global Network for Rights and Development (GNRD), and Saudi Arabia Miahona.

The conference was a part of Global Institute for Water, Environment and Health (GIWEH) programs that include the organization of series of workshops, training sessions, and conferences aimed at bridging the gap between policy, strategy practical and science in the



management of water resources and environment fields as well as inspiring the water and environmental communities to share knowledge and enhance awareness of a changing environment.

The three-day conference was structured through main oral sessions and a poster session (Appendix I) in order to allow in-depth discussion on the aspects of water resources and environmental management with a focus on key issues related to the adoption of integrated approaches, technology transfer and its institutionalization, climate change impact, and hydro-diplomacy of shared water sources. The different sessions provided a platform to debate challenging and emerging issues, share experience on the best practices, and network through presentations, panel discussions and one-on-one dialogues. The main themes of the conference were addressed in eight main sessions:

- i. *Regional Challenges to Water Security*
- ii. *Alternative Approaches to Water Security*
- iii. *Wastewater Treatment and Reuse Methods and Concerns*
- iv. *New Technologies (Information and Innovation)*
- v. *Innovation promotion and technology transfer of water R&D results and technologies: the role of intellectual property and WIPO available tools*
- vi. *Water Governance and Security*
- vii. *Contemporary Water Quality Concerns*
- viii. *New Technologies (Modeling and Simulation)*

The conference target group was composed of academia, government agencies, local government, NGOs, private sector, and water and environment networks from the Arab world, Europe, Asia and the United States. ***The table of the conference's participants is shown in Appendix II.***

### III. Opening of the Conference

**Opening statement** – The conference was inaugurated by Dr. Nidal Salim, Founder and Director of the Global Institute for Water, Environment, and Health (GIWEH) and Chairman of the ICWRRE-2013 conference. In his opening speech, Dr Nidal stressed the growing scarcity of water and the important contribution of the United Nations 2013 Year of Water Cooperation to manage water sources at all levels to enhance human wellbeing. He reflected on the effort made at different levels to manage water sources and protect the environment. He stressed the importance of water availability to meet the challenge of socio-economic development and preserve and protect the ecosystem in a changing environment:

“Today, the world suffers from severe water competing uses caused by high population growth, rapid urbanization, changing consumption pattern and climate change impact. Such stresses will have a direct influence on food security, health, economic growth, and poverty alleviation. It is everyone responsibility to concentrate our effort to ensure that the future generations with sustainable environment, and better life quality.”

Dr. Salim briefly discussed the content of the conference agenda, which would provide a platform for debate of priority issues, success stories, and management efforts at national and regional levels. He underlined that this meeting would provide an opportunity for all those who were concerned with water and environment issues to unite efforts and share experiences to draw a practical map of



possible solutions, using scientifically sound and appropriate diagnoses dialogues.

At the end, Dr. Salim wished the participants successful debating and voiced his hope for more contributions to advance the management of water sources and environment at all scales. He expressed his appreciation for the participations, ambassadors and over 150 scholars interested in debating the contemporary issues of water, food, energy security and climate change. ***The complete Dr. Salim's speech is shown in Appendix III.***

After the Opening Statement three keynote speeches were made by the following people:

Ms. Ann Tutwiler, Special Representative of the Director General to the UN-Geneva and the World Economic Forum, Director FAO Liaison Office, gave a brief introduction on the issue of **Water Management and Food Security: A Fragile Equation.** Water scarcity and food security continue to be deeply intertwined, presenting a challenge to the world food requirement. The agriculture sector is responsible for 70% of all water withdrawal and in some countries consumes more than 85 % of water withdrawal. Better management of water sources can contribute to increased food production.

Mr. Christian Wichard, Deputy Director General, Global Issues Sector, and World Intellectual Property Organization (WIPO), spoke about **“Water related technologies: the role of intellectual property, innovation promotion and technology transfer”** to conserve and treat water and reduce pollution load. Mr. Wichard shared his thoughts on the ways in which intellectual property, innovation, and promotion of technology transfer can have a deep and lasting effect on the future of food, water, and energy security. He presented the WIPO initiative to launch a website, under the name **WIPOGreen**, to serve as a forum through which technologies can be advertised and matched to those that seek them.

The last key note speech was given by **His Excellency Ambassador Hyo-Sung Park**, who reflected on the OECD prediction that by 2015, 40% of the world's population will live in areas with serious water stress. Ambassador Park believes that the solution lies in encouraging stakeholders and the international community to cooperate and share their best practices.

***The summaries of their speeches are offered in Appendix IV.***

## IV. Presentations and Dialogue

The eight technical sessions of the conference addressed many priority and emerging issues in the water and environment fields with keynote speeches, presentations and follow debates chaired by eminent experts. Sessions:

### I. Regional Challenges to Water Security Session

**Keynote Speech:** Dr. Thomas Fitschen, Ambassador, Deputy Permanent Representative, Permanent Mission of Germany in Geneva, focused on the nexus between water, energy, and food security, and stressed that the most practical solutions involve increased research, innovation, political involvement, and transboundary cooperation.

#### ***Two presentations followed:***

Mr. Mohammad Alaoui, Head of Small and Medium Dams, Directorate of Hydraulic Works, Ministry



of Energy, Mines, Water and Environment Morocco, on **“The water sector in Morocco – status and strategic vision”**. Mr. Alaoui discussed the status of water sector management in Morocco and its challenges, as well as the responsiveness of the political sector to them. He indicated that the previous practice of overexploiting ground water resources requires that the future efforts of the water sector in Morocco lies in mobilizing conventional and non-conventional water sources.

The second presentation was given by Dr. Khaled Rashed, Department of Civil Engineering, and University of Tripoli, Libya under the title **“Assessment of institutional and asset-related functions in the urban water sector in Libya.”** Dr. Rashed’s presentation focused on the ways in which the urban water sector in Libya has both institutional and asset-related functions. Given that there is no surface water in Libya, the role of institutions and the cooperation of all key players in the urban water sector of Libya has become increasingly vital.

## **II. Alternative Approaches to Water Security Session**

**Keynote Speech:** Dr. Johannes van der Kwast from UNESCO-IHE, Institute for Water Education, the Netherlands discussed **“Coupled Land Use and Hydrological Modeling for Management of Ecosystem Services ”**. He addressed the fact that land-use changes influence the hydrological cycle and vice versa. The sophisticated spatial dynamic planning tools that have been developed in the last decades to support policy makers in the decision making process do not take into account the mutual feedback between land use and hydrology.

In his research he discussed that integrating spatial decision support systems can provide feedback between land use and hydrology by coupling the SITE (Simulation of Terrestrial Environments) land-use model with the ACRU hydrological model. This framework enables policy makers to assess the impact of their planning scenarios on ecosystem services using a web-based tool that interactively presents trends in space and time of spatial indicators derived from both models.

### **Two presentations followed:**

Dr. Lifend Li, Director Freshwater Program, (WWF), discussed the concept of the “water footprint” as a mean to rationalize the use of water in the agriculture sector. Dr. Li stressed the importance of engaging with the private sector in water resources management in order to address the common water challenge the world is facing. There are many tradeoffs between water, food, energy, and the ecosystem. The decline in the freshwater system is happening much faster than that of the marine system, and climate change is affecting the timing and frequency of water distribution. To respond to this common challenge, Dr. Li understands there to be a need for a global framework to secure water for both humans and the ecosystem. The most important goals should be to ensure that rivers continue to flow, and to protect flagship species and freshwater habitats throughout the world.

Dr. Ahmed Alshabban, Department of Geography, Qassim University, Buraydah, Saudi Arabia, discussed **“The role of Water in shaping the image of rural life in Fadak area-Saudi Arabia,”** during the poster session later in the day. Dr. Alshabban focused his work on the visual image of Alhaid to represent rural life in both natural and human conditions. His study reviewed the land in this area, and should lead to sustainable development and modernization. Dr. Alshabban hoped to determine through his research the most prominent natural factors that contribute to the conditions in the region, how these factors shape rural life, and the impact of springs on Alhaid, both past and present. One possible recommendation Dr. Alshabban offered at the end of his research was for relevant stakeholders to support and invest in rural development in the Alhaid area.



### III. Wastewater Treatment and Reuse Methods and Concerns Session

**Keynote Speech:** Prof. Walter Wildi, Professor in geology, University of Geneva, University of Geneva opened the session with his research on **“Hazardous Waste Disposal and Drinking Water Quality.”** This presentation dealt with the question of how to protect human health and the environment, and in particular how to protect long-term drinking water quality from a potentially harmful impact due to leaching from a hazardous waste disposal. The case study applied to the project for nuclear waste disposal in Switzerland.

#### **Two presentations followed:**

Mr. Nanchoz Zimmermann, Autark Engineering AG, Switzerland, gave a presentation on the **“Application of High Rate Anaerobic Reactor Technology for decentralized wastewater treatment and reuse systems”**. Mr. Zimmerman gave an example of a septic system that is used by 180,000 people on the Palestinian and Egyptian border with a centralized wastewater management system. In this conventional approach, wastewater is transferred outside of the city and leads to several disadvantages, including distance between the treatment plant and the sites for reuse, the vulnerability of the power of the system, and the difficulty this system poses to future expansion of the population. Mr. Zimmerman’s solution to these problems lies in decentralizing the system by integrating high rate anaerobic reactor technology that would be implemented close to the site.

Dr. Jamal Y. Al-Dadah, Planning Department, Water Authority, Gaza Strip, Palestine followed with a presentation on **“Using Treated Wastewater as an Adaptation Measure of Water Scarcity and Climate Change in Gaza Strip.”** Dr. Al-Dadah outlined the impact of using treated wastewater for irrigation on soil chemical properties including the content of organic matter and plant growth. He discussed two experiments that were carried out in the Al- Zaitoun area, as well as the Khan Younis Governorate through ICARDA funded projects in Gaza Strip during the period May 2010 to September 2012. The increases in wastewater reuse will provide an alternative to groundwater utilization by year 2015. Furthermore, wastewater reuse in Gaza could provide a mitigation solution to climate change through a reduction in greenhouse gases by using less energy for wastewater management compared to that for importing water, pumping deep groundwater, and seawater desalination.

### IV. and V. New Technologies-Information and Innovation and Innovation promotion and technology transfer of water R&D

These two sessions were devoted to keynote speeches on the role of intellectual property and World Intellectual Property Organization (WIPO), available tools and capacity building initiatives to promote the patents and transfer of technologies.

Ms. Irene Kitsara, Project Officer at WIP provided briefing on new water and water related technologies, the role of patent information, and WIPO assistance in this process. Ms. Kitsara offered insight concerning the increases in academic patenting, especially water filtration. She stressed that synergies and potential cooperation partners can be better coordinated through the patent process, which is expected to be the key to the future advancement of water technologies. The most important role of patents and specifically the role WIPO in this regard is to encourage cooperation in



order to provide a 'common language' that can be understood by, scientists, organizations and other actors to seek solutions to the water problem.

The second speech was given by Ms. Olga Spasic, the Head of the Innovation Structures Section at WIPO, on new information and innovation technologies providing comments on the role of intellectual property in water technology, as well as appropriate ways to make research and innovation in water technology attractive to developers and researchers.

## VI. Water Governance and Security Session

**Keynote Speech:** Mr. Charles Stadler, the Département de l'intérieur du canton de Genève, made a presentation titled **“L’eau; un élément fédérateur de la coopération transfrontalière”**, discussing the transboundary issues between Geneva and France concerning water treatment and conservation. He briefed the participants on the water sharing issues between Geneva and France experienced during the past few decades and the importance of sufficient cooperation to solve these issues. Mr. Stadler stated that water problems do not recognize man-made boundaries and called for better transboundary collaboration especially for urban planning purposes.

### **Four presentations followed:**

Ms. Hasnaa El Jamali from the Graduate Institute of International and Development Studies in Geneva, Switzerland, presented a **“Community-Based Water Management: The Oasis of Figiog, Morocco Recent Extensions and Transformations”**, discussing the complementary nature of community and private management of water resources, and the importance of using effective water management techniques to secure the long evolution of oases.

Ms. Emel Zerrouk, Kyoto University, Graduate School of Global Environmental Studies, Japan/UK, made a presentation on **“Land Grabbing/Water Grabbing in Shared Water Basins: The Emergence of New Actors”** as a case study of the Hatgzi Dam on the Salween River reflecting on how governments can work together to limit the effects of water and land grabbing.

Ms. Pervin Yanikkaya Aydemir of Yeditepe University, Istanbul, Turkey, discussed **“An Anthropological Approach to HEPP’s in Eastern Anatolia”**, the outcome of the hydroelectric power plants projects (HEPP) in Aksu Valley in Turkey on the lives of the local community. She concluded that water users should be considered in the water management, planning and decision-making process due to the impact of HEPPs on their lives.

Professor Shams El Din El Hajjaji, a public prosecutor, presented his work **“The Long Empty Canyon: A Study of the New/Old Legal Problems of the Nile Basin”**. This transborder basin is the subject of many complex legal arguments between various states and actors, most specifically Egypt, Sudan, and Ethiopia. He focused on the specific issues for the Nile countries of 'historical' and 'acquired' rights, which create a difficult dynamic. Equitable utilization and the principle of obligation not to cause significant harm are policies that need to be applied to maneuver around the legal issues of the Nile Basin.



## VII. Contemporary Water Concerns Session

### *Four presentations followed:*

Assist. Prof. Alaa Husaen Wadie, University of Babylon, Head of Environmental Engineering Department, Iraq made a presentation on **“A Modeling Approach Towards Improving Compliance of Treated Water Quality to Reduce Manpower and Chemicals”**, discussing a model that can both predict and diagnose water contamination during the water treatment process. The model could improve compliance of treated water quality to reduce manpower and chemicals to help individuals and organizations to better understand the impact of their actions on water treatment.

Dr. Khalid Qahman, Ministry of Environmental Affairs, Palestine, gave a speech on **“Salinity of Drinking Water and its association with Renal Failure in Gaza Strip Palestine”**, discussing the connection between renal failure and the salinity of drinking water in Palestine. Dr. Qahman investigated the water quality of drinking water in the southern Gaza Strip as the chloride levels in most wells were incompatible with WHO drinking standards, and increases in renal failure are related to levels of fluoride. He called upon officials to modify the mixing process according to fluoride level and increase public awareness of the issue.

Dr. R. Alkendi, Biology Department, United Arab Emirates University, UAE, made a presentation on **“Bacterial Quantification in Sharjah’s Home Water Storage Tanks”**, which tested the bacterial content of home water storage tanks in Sharjah, United Arab Emirates by using the Membrane Filter technique. She indicated that, despite the UAE's regulation requiring the absence of E. coli or Coliform, the analyses found that over 60% of the home supplies had significant amounts of coliform. And over 10% of homes studies had significant amounts of E. coli in their water tanks. Her results implied the presence of other contaminants in the water coming from the same route as total coliform bacteria.

Dr. Senthil Kumar Sadasivam, National College, PG and Research Department of Biotechnology, India, presented **“Biological Treatment of textile effluent and its reuse in Irrigation: Encouraging Water Efficiency and Sustainable Development”** as an appropriate way to isolate potential microorganisms from contaminated soil and apply these organisms in decolorization, degradation and detoxification of textile wastewater. The use of treated-detoxified textile effluent could sustainably be used for irrigation, and would thus be an economically and environmentally friendly solution to the effluent problem.

## VIII. New Technologies: Modeling and Simulation Session

**Keynote Speech** was made by Professor Abdelkader Larabi from Ecole Mohammadia, Morocco, under the title **“3D Groundwater Flow Model for a semi-arid region of Tafilalet Oasis System (South East of Morocco)”**. This model could help decision makers evaluate alternative schemes for development and exploitation of groundwater resources. He discussed the use of the geographical information system (GIS) for the organization and treatment of data in conjunction with application geo-statistical and hydro-geological models.





### ***Five presentations followed:***

Professor Kamal Mohammedi, Bougara University, Algeria, presented on the **“Environmental Impact of Seawater Desalination Plants: Case Study in Algeria”**, discussing the impacts of brine discharge, chemicals used in cleaning, and thermal pollution from desalination plants the surrounding environment. He concluded that due to the small size of the Cap Djinet plants, there was only a local minimal effect, but proposed to extend the study to further desalination plants along the Mediterranean coast.

Dr. Salaheddin Shmela, Tripoli University Civil Engineering Department, Libya, followed with the presentation on the **“Seepage Phenomenon for Wadi Megenin Dam”**, discussing the impact of the Megenin dam, built near Tripoli in 1973. He indicated that in 2003 seepage was observed downstream of the main dam. Dr Shmela used a ground penetrating radar survey, piezometric analysis, and temperature field evaluation to assess the impact of seepage on the dam safety. He identified critical zones in the dam site and water seepage paths, determined the amount of total water seepage capacity through the dam foundation, and recommended points to avoid any future problems resulting from seepage.

Mr. Baghdadi Boukerma, Université des Sciences et de la Technologie d’Oran, Département d’Hydraulique, Algeria, presented **“Contribution des systèmes d’informations Géographiques à la gestion des ressources en eau. Cas du complexe aquifère de la plaine de Mascara (Algérie) ”**, discussing the use of the geographical information system (GIS) in the domain of water science. Mr. Boukerma concluded that GIS is a useful tool for decision making regarding the management, exploitation, and protection of water resources.

Dr. Emad Al Ali, Kuwait Institute for Scientific Research, Kuwait, spoke about **“Groundwater Simulation System Study on Physical and Climatic properties on Kuwait Group Aquifer”**. He briefly discussed a conceptual design system using brackish groundwater in conjunction with treated wastewater systems to address the problem of water scarcity and sustainability.

The final presentation was made by Dr. Kadhim Naief al-Ta’ee of the College of Engineering, University of Babylon, Iraq, titled **“Feasibility Study of Al-Masab Al-Aam Water Drainage in Thi Qar and Treatment for Irrigation”**. Dr. Kadhim Naief al-Ta’ee assessed the sustainability of drainage water al-Masab al-Aam for irrigation with or without treatment. He concluded that the chemical and physical properties of drainage water and nearby rivers are such that they can be blended for irrigation purposes.

### **IX. Posters’ Session**

On third day of the conference many papers were presented within the poster sessions covering different issues on water and environmental management and had the following titles:

- **Mr.Djamel Boudieb, M’hamed Bougara University, Boumerdes, Algeria. Interactive website with Systems Analysis Environment for Prefeasibility Studies of Small Scale Water and Power Production Units Integrating Renewable Energy,**



- *Mr. Abdelkader Bouzaine, MESO team, LEMI, M Bougara University, Boumerdès, Algeria. **Integration of Renewable Energy to Tala-Oulili Desalination Plant in Algeria. Energy and Energy Performances Analyses,***
- *Mr. Karim Chahid, Laboratoire LAMEC, Faculty des sciences Dhar El Mehraz, Fès. **Effect of Alpha-cypermethrin on morphological parameters in tomato plants (Lycopersicon esculentum Mill.),***
- *Dr. Mohamed Salah Abou Ragab, The International Criminal Responsibility of the Heads and Leaders of States. **Securing the Water Environment from Pollution, "A Study on the Domestic and the International levels",** Judge*
- *Ms. Fatma Larbi, Laboratoire de chimie des polymères, Département de chimie, Faculté des Sciences, Université d'Oran, Alegria.*
- *Mr. Manel Merradi, Institut des Sciences de la Nature et de la Vie, Université Abbés Laghrou, Khenchela, Alegria **Activation chimique de quelques argiles naturelles en vue de leur valorisation industrielle pour le traitement des eaux de rejets textiles, Waste water treatment: preserving our water resources (WWTP of the city of Khenchela/Alegria).***
- ***Etude de la Contamination par les Eléments Traces Métalliques Plomb (Pb) Et Zinc (Zn) des Sédiments de l'Oued Aissi (Tizi Ouzou, Algérie),** Ms. Rouibet Boubkeur, Faculté des Sciences Biologiques, Université des Sciences Technologiques Houari Boumediene (U.S.T.H.B), Alger, Alegria.*
- *Mr. Belkacem Absar, Département de Génie des Procédés, Faculté des Sciences et de la Technologie, Université de Mostaganem, Algeria. **Modeling and Simulation of Reverse Osmosis system with Renewable Energy,***
- *Dr. Abdullah Almisnid, Qassim University, Department of Geography Qassim, Saudi Arabia Department of Geography Qassim, Saudi Arabia **Potential Effects of Climate Change on Irrigation Water Use in Gassim Area of Saudi Arabia,***
- *Dr. Mosaed Abd ElAtty Shetewy. PhD in International Law, Egypt. **Legal Regulation on Dam Construction on International Rivers: The compliance of Nile Basin upstream States of the Regulations,***
- *Ms. Zekri Jihane, Université El Hadj Lekhder Batna, Alegria **Evaluation des variations climatiques thermiques: cas de Constantine pour la période (1978-2007).***
- *Mr. Smaili Youcef, University, Boumerdès, Algeria **Contribution to the Improvement of Seawater Desalination Plants Availability Using Bayes Networks Based Multi-Decision Approach,***
- *Mr. Meriem Melghit, Laboratoire de Biologie et Environnement, Université Mentouri de Constantine, Département de Biologie Végétale et d'Ecologie, Algeria. **Evaluation du Degré de***



### **la Pollution Organique des Eaux de Surface : Cas des Barrages Hammam Grouz et Béni Haroun,**

- *Prof. Ali Ananzeh, Director, GNRD in Amman, Jordan. The Geomorphologic Effects of Urbanization of the city of Karak-Jordan,*
- *Dr. Jawad Kadhim Abood Al Rofai, Iraq. Account some economic input for the development of the tourism sector with the help system (GIS) in the Regional surrounding of Dhi Qar District, Iraq.*

## **IV. Recommendations**

To conclude the ICWRE-2013 Conference, the representatives of academia, government agencies, local government, NGOs, private sector and the UN organizations debated many water and environmental priorities and emerging issues that represent different degrees of importance at the national, regional and international levels. The discussion was followed by a series of recommendations aimed to further guide GIWEH and its partners' efforts to promote the issues discussed at ICWRE-2013, and to draw attention of the World Water Forum and the United Nations programs.

Principal persons: Professor Abdelkader Larabi, Ecole Mohammadia, Morocco, Dr. Johannes van der Kwast, UNESCO-IHE, Institute for Water Education, Dr. Jamal Y. Al-Dadah, Water Authority, Planning Department, Gaza Strip, Palestine, Dr. Khaled Rashed, University of Tripoli, Department of Civil Engineering Tripoli, Prof. Kamal Mohammedi, LEMI, M Bougara University, Algeria and Ms Maria Soledad Iglesias-Vega, WIPO, suggested that many water and environmental issues need special attention from all parties concerned to order to enhance the management of water sources and environment preservation and protection.

Priorities and emerging issues raised at the final session focused on water scarcity and quality, water-related disasters and their associated changes to hydrological topics, the importance of the eco-hydrological system, dissemination of arid lands information, water education and a global network of water. Other debated issues were environmental management through a multidisciplinary approach consisting of engineering, water governance, geographical, social, and economic perspectives; cooperation and sharing of data and knowledge, including knowledge contained in patents; ecosystem services evaluation from an economic prospective; focus on water and food security under circumstances of climate change; intergradations water management; and health risks in the MENA region.

The other issues that came into discussion were desalination evaluated from economic, social, environmental aspects, topics which are available for research funding (scholarships or research grants in the water field especially in arid and semi-arid regions). These topics are marked as the responsibility of the UN organization such as FAO and UNESCO. Further topics included the need for private sector investment in water development programs and projects; enhanced cooperation between countries that share water resources; water pricing analysis, especially in the Arab world; promotion of humans and their rights for water, energy and living in clean environment; and the creation of a multidisciplinary platform based on Internet technologies sharing courses, models, and



data, including spatial data infrastructure for all participants in line with UNESCO IHE project to enhance the data accessibility.

## **ICWRE-2013 Conference Recommendations**

**These recommendations are aimed at National decision makers, water and environmental professional, NGO, private sector, United Nations and Regional organizations.**

### ***I – Integration***

1. Integrate strategies for managing water, climate change, health, food, and security in a multidisciplinary way;
2. Reform the national institutional/legislative framework for enhancing governance issues for the implementation of Integrated Water Resources Management( IWRM) approach;
3. Pay due attention to the importance of groundwater as a strategic resource;
4. Promote the undertaking of comparative analysis of resource mobilization;
5. Standardize the wastewater treatment processes , especially in Arab countries, through a governmental action;
6. Recognize the need to apply a multidisciplinary approach in the formulation of water management policies;
7. Emphasis on the need to pay more attention on the evaluation of environmental impacts on water sources

### ***II – Economics***

1. Stress that water has social and economic values that should be recognized in the formulation and implementation of management plans and programs, develop better water pricing to reflect real costs of water production and usage, and change attitudes that regard water as a free resource.
2. Support and increase funding scientific research on resource mobility and integrating water strategies with the implication climate change impact.
3. Increase the involvement of the private sector in water development projects, and increase cooperation among governments and the UN and NGO systems to approach these issues from a holistic view.

### ***III – Cooperation***

1. Need to increase cooperation in terms of information technologies, especially for data and knowledge sharing among scientists, NGOs and taxpayers;
2. Encourage dialogue between local scientists and practical leaders;
3. Create a mechanism to follow and operationalize the recommendations made at the conference by forming a follow up community to among participants.



#### ***IV – Education and Learning***

1. Enhance awareness of what others are doing in terms of water management projects and learning from good examples, as well as educating the youth on sustainable water use;
2. Enhance the bridging in gap between the fields of water resources development and management and stream lining the mutually understandable language (scientific, social, legal fields) and people and making policy decisions to get a holistic view;
3. One third of the information contained in patents can not be retrieved elsewhere. Enhance awareness and skills on the use of patent information as a tool to identify, among other, public domain technologies (e.g. patents not protected in a specific geographical area), emerging technologies, and potential partners (e.g. for joint research projects, technology and know-how transfer, public-private partnerships and for other types of cooperation);
4. Enhance awareness and skills of water research institutions and other water relevant stakeholders to deal with intellectual property (IP) issues when: designing research and development (R&D) projects; dealing with R&D results management, protection, valuation, marketing, transfer and licensing; entering in R&D collaborations; and creating start-ups and spin-offs;

#### ***V – United Nations and International organizations***

1. Recognize the contribution of the World Intellectual Property Organization (WIPO) patent landscape reports (PLRs) on “Water Desalination Technologies and the Use of Alternative Energies for Desalination” and on “Water Treatment/Purification Technologies”;
2. Call on parties concerned to take advantage of information contained at existing WIPO patent information tools (e.g. PATENSCOPE) and of WIPO technical assistance and capacity-building programs in the area of patent information and technology transfer;
3. Request WIPO to offer back-to-back sessions at GIWEH-ICWRE 2014 Conference in order to enhance participants awareness and practical skills on patent information searching and on intellectual property management issues for water R&D and technology transfer and licensing;
4. Recognize the effort of the World Health Organization (WHO) to promote understanding that water, life, and the well-being of people as topics that are not only inevitably interconnected, but also must be addressed as we move forward;
5. Recognize that The active NGOs’ involvement and their increased transparency, must be strengthened;
6. Call on the UN organization to establish Departments or Divisions to manage water issues
7. Call on the UN bodies to increase advisory services to the member states on the management and protection to resources.

***Note: water equality and waste water are issues to be given due consideration as part of the themes for next year GIWEH-ICWRE conference.***



## V. ICWRE-2013 Award

The winners of the **ICWRE-2013 Award** were announced at the Final Session of the **Second International Conference on Water Resources and Environmental Management: "Water, Food, Energy Security and Climate Change" (ICWRE-2013)**. This award recognizes best papers presented during the Conference. The authors of best papers were given a memorable ICWRE-2013 Statue and a status of an invited participant for next Conference. The ICWRE-2013 winners were:

First Award: **Ms. Emel Zerrouk**, Kyoto University, Graduate School of Global Environmental Studies, Japan/UK with her research titled ***"Land grabbing/ Water Grabbing in Shared Water Basins: The Emergence of New Actors."***

Second Award: **Dr. Khalid Qahman**, Ministry of Environmental Affairs from Palestine with the research titled ***"Salinity of drinking water and its association with Renal Failure in Gaza Strip Palestine."***

Third Award: **Dr. Senthil Kumar Sadasivam**, National College, PG and Research Department of Biotechnology from India with the research titled ***"Biological Treatment of textile Effluent and its reuse in Irrigation: Encouraging Water efficiency and Sustainable Development."***

The high quality of all the Conference's papers made necessary to increase the awards to three instead of two.

## VI. Conference organization committee

1. Dr. Nidal Salim, Director, GIWEH.
2. Didier Barthe, Secretary, GIWEH.
3. Amira Laribi, Project Coordinator, GIWEH.
4. Evgenia Kondrakhina, Regional Manager, GIWEH.
5. Nadia Albouz, Executive Assistant, GIWEH.
6. Sophie Yermatten, Intern, Project Coordinator, GIWEH.
7. Faith Benson, Intern, Project Coordinator, GIWEH.
8. Sarah Collins, Intern, Project Coordinator, GIWEH.
9. Philippe C. Ecuillon, IRED.
10. Maha Abu Al Naja, Project Coordinator, GNRD.

## VII. Acknowledgement

The conference organizers acknowledge with appreciation the contribution of experts from the Arab region, Europe, United Nations and international organizations in reviewing abstracts, keynote presentations and sponsorship of the conference. Appreciation is extended to Professor Abdelkader Larabi, Ecole Mohammadia, Morocco, Professor Szöllözi Nagy, Rector of the UNESCO-IHE Institute for Water Education in Delft, The Netherlands, professor Mohamed Abdulrazzak from Saudi Arabia, WIPO staff, and Dr. Walid Abdul Rahman, CEO of Mayhomna.



## Appendix I: Conference Agenda

### Tuesday April 9

**8h30-9h30: Registration**

**9h30- 10h30: Opening Ceremony: International Center for Conferences (CICG), Geneva, Switzerland**

**Opening Remarks:** Dr. Nidal SALIM, Director and founder of GIWEH- Global Institute for Water Environment and Health, Genève-Switzerland.

#### **Welcome and background:**

- **“Water Management and Food Security: A Fragile Equation.”** Ms. Ann Tutwiler, Special Representative of the Director General to the UN-Geneva and the World Economic Forum, Director FAO Liaison Office.
- Mr. Christian Wichard, Deputy Director General, Global Issues Sector, and World Intellectual Property Organization (WIPO): **“Water related technologies: the role of intellectual property, innovation promotion and technology transfer”**.
- **“World Water Forum/2015”**, His Excellence Mr. Hyo-sung Park, Ambassador and Deputy Permanent Representative at Korean Mission in Geneva.

**10h30-11h00: Refreshments, Coffee Break**

**11:00-12:30: Session I: Regional Challenges to Water Security**

**Keynote speaker:** Dr. Thomas Fitschen, Ambassador, Deputy Permanent Representative, and Permanent Mission of Germany in Geneva

#### **Panel Discussion:**

- **“The water sector in Morocco – status and strategic vision”**, Eng. Mohammad Alaoui, Head of small and medium dams- Directorate of Hydraulic Works, Ministry of Energy, Mines, Water and Environment Morocco.
- **“Assessment of institutional and asset-related functions in the urban water sector in Libya”**, Dr. Khaled Rashed, University of Tripoli, Department of Civil Engineering Tripoli, Libya

**12:00-14:00 Lunch**

**14:00-15:45: Session II: Alternative Approaches to Water Security**

**Keynote Speaker:** **“Coupled Land Use and Hydrological Modeling for Management of Ecosystem Services”**, Dr. Johannes van der Kwast, UNESCO-IHE, Institute for Water Education, the Netherlands.

#### **Panel discussion:**

- WWF – Water footprint, Dr. Lifend Li, Director Freshwater Program, (WWF).
- **“The role of Water in shaping the image of rural life in Fadak area-Saudi Arabia”**, Dr. Ahmed Alshabban, Department of Geography, Qassim University, Buraydah, Saudi Arabia.



**15h30-16h00 – Coffee break**

**16h00-18h00 – Session III: “Wastewater Treatment and Reuse Methods and Concerns”**

**Keynote speaker:** Prof. Walter Wildi, Professor in geology, University of Geneva. **“Hazardous Waste Disposal and Drinking Water Quality”**

**Panel discussion:**

- **“Application of High Rate Anaerobic Reactor Technology for decentralized wastewater treatment and reuse systems”**, Mr. Nanchoz Zimmermann, Autark Engineering AG, Switzerland.
- **“Using Treated Wastewater as an Adaptation Measure of Water Scarcity and Climate Change in Gaza Strip”**, Dr. Jamal Y. Al-Dadah, Water Authority, Planning Department, Gaza Strip, Palestine.

**Wednesday April 10**

**09-10h30 - Session IV: “New Technologies (Information and Innovation)”**

**Speaker:** Ms. Irene Kitsara, Project Officer, Patent Information Section, Access to Information and Knowledge Division, Global Infrastructure Sector, WIPO

**10h00-11h00 - Session VII: “Innovation promotion and technology transfer of water R&D results and technologies: the role of intellectual property and WIPO available tools and capacity in this area building”**

**Speaker:** Ms. Olga Spasic, Head, Innovation Structures Section, Innovation Division, Innovation and Technology Sector, WIPO

**10h30-11h00 Coffee Break**

**11h00-12h30 – Session V (1): “Water Governance and Security”**

**Key note Speaker:**“L’eau: un élément fédérateur de la coopération transfrontalière”, Mr. Charles Stadler, Département de l’intérieur, de la mobilité et de l’environnement, Canton de Genève, Switzerland.

**Panel Discussion :**

- **“Community-Based Water Management: The Oasis of Figiog, Morocco Recent Extensions and Transformations”**, Mrs. Hasnaa El Jamali, Graduate Institute of International and Development Studies, Switzerland.
- **“Land Grabbing/ Water Grabbing in Shared Water Basins: The Emergence of New Actors”**, Ms. Emel Zerrouk, Kyoto University, Graduate School of Global Environmental Studies, Japan/UK.
- **“An Anthropological Approach to HEPPs in Eastern Anatolia”**, Mr. Pervin Yanikkaya Aydemir, Program at Anthropology Department, Yeditepe University, Istanbul, Turkey.





**12h-14h00 Lunches**

**14h00-18h00 – Posters' Session**

**14h00-15h30 – Session V (2): Contemporary Water Quality Concerns**

**Moderator: Prof. John Pote, F.-A, Forel Institute- University of Geneva**

**Panel Discussion:**

- **“A Modeling Approach Towards Improving Compliance Of Treated Water Quality To Reduce Manpower And Chemicals”**, Assist. Prof. Alaa Husaeen Wadie, University of Babylon, Head of Environmental Engineering Department, Iraq.
- **“Bacterial Quantification in Sharjah’s Home Water Storage Tanks”**, Dr. R. Alkendi, Biology Department, United Arab Emirates University, UAE.
- **“Salinity of drinking water and its association with Renal Failure in Gaza Strip Palestine”**, Dr. Khalid Qahman, Ministry of Environmental Affairs, Palestine.
- **“Biological Treatment of textile Effluent and its reuse in Irrigation: Encouraging Water efficiency and Sustainable Development”**, Dr. Senthil Kumar Sadasivam, National College, PG and Research Department of Biotechnology, India.

**16h00-18h00 – Session VI (1): “New Technologies: Modeling and Simulation”**

**Keynote Speaker: “3D Groundwater Flow Model for a semi-arid region of Tafilalet Oasis System (South East of Morocco),” Prof. Abdelkader Larabi, Ecole Mohammadia, Morocco**

**Panel discussion:**

- **“Environmental Impact of Seawater Desalination Plants. Case Study in Algeria”**. Prof. Kamal Mohammadi, LEMI, M Bougara University, Alegria.
- **“Seepage Phenomenon for Wadi Megenin Dam”**, Dr. Salaheddin Shmela, Tripoli University, Civil Engineering Department, Tripoli, Libya.
- **“Contribution des systèmes d’informations Géographiques à la gestion des ressources en eau. Cas du complexe aquifère de la plaine de Mascara (Algérie)”**, Mr Baghdadadi Boukerma, Université des Sciences et de la Technologie d’Oran, Département d’Hydraulique, Alegria.
- **“Groundwater Simulation System Study on Physical and Climatic properties on Kuwait Group Aquifer”**, Dr. Emad Al Ali, Kuwait Institute for Scientific Research, Kuwait.
- **“Feasibility Study of AL-Masab AL-Aam Water Drainage in Thi Qar and Treatment for Irrigation”**, Dr. Kadhim Naief Kadhim, College of Engineering, University of Babylon, Iraq.



**Thursday April 11**

**9h00-10h30 Session XI - Roundtable Discussion**

**Special Session: The Nile Basin**

- **“The long empty canyon: a study of the old/new legal problems of the Nile Basin”**, Prof. Shams El Din El Hajjaji, Public Prosecutor, Public Prosecution Bureau- Ministry of Justice, Egypt.

**10h30-11h00 Coffee Break**

**11h00-12h30 Sessions XII: Conclusions and Recommendations**



## Appendix II: List of Participants

Name	Organisation and Position	Country
Abdelhafid Barca	Université des sciences et de la technologie d'Oran Mohamed Boudiaf	Alegria
Abdelkader Bouziane	MESO team, LEMI, M Bougara University	Alegria
Abdelkader Larabi	Ecole Mohamadia	Morocco
Abdulaziz A. Al-Muraikhi	Head of water Research Section, Department of Water (DoW), Ministry of Environment (MoE)	Qatar
Abdullah Almisnid	Department of Geography, Qassim University	Saudi Arabia
Abdullatif A. Neamatallah	Environmental Sciences Department, King Abdulaziz University	Saudi Arabia
Absar Belkacem	Département de Génie des Procédés, Faculté des Sciences et de la Technologie, Université de Mostaganem	Alegria
Ali Alamance	Director, GNRD	Jordan
Alla Hussaeen Wadie	Head of Environmental Engineering Department, University of Babylon	Iraq
Amrein Roman	Director at Amrein-Pieren SA	Switzerland
Ann Tutwiler	Special Representative of the Director General to the UN-Geneva and the World Economic Forum, Director FAO Liaison Office	Switzerland
Aziez Zeddouri	Laboratoire de BioGéoChimie des milieux désertiques, Université Kasdi-Merbah	Algeria
Baghdadi Boukerma	Département d'Hydraulique, Université des Sciences et de la Technologie d'Oran	Algeria
Belkacem Absar	Département de Génie des Procédés, Faculté des Sciences et de la Technologie, Université de Mostaganem	Alegria
Bougueroua Omar	Université des sciences et Technologies Houari Boumédiène	Alegria
Charles Stadler	Département de l'intérieur, de la mobilité et de l'environnement, Canton de Genève	Switzerland
Christian Wichard	Deputy Director General, Global Issues Sector, and World Intellectual Property Organization (WIPO)	Switzerland
Djamel Boudieb	M'hamed Bougara University	Alegria



Elina Merzoeva	UNECE	Russia
Emad Hussaine Al-Ali	Kuwait Institute for Scientific Research	Kuwait
Emel Zerrouk	Kyoto University	Japan
Fatma Larbi	Université Badji Mokhtar Annaba, Laboratoire Ressource en eau et développement durable	Alegria
H.E. Mr. Hyo-Sung Park	Ambassador and Deputy Permanent Representative at Korean Mission in Geneva	Switzerland
Hasnaa El Jamali	Graduate Institute of International and Development Studies	Switzerland
Irene Kitsara	Project Officer, Patent Information Section, Access to Information and Knowledge Division, Global Infrastructure Sector, WIPO	Switzerland
Jamal Y Al-Dadah	Water Authority, Planning Department, Gaza Strip	Palestine
Jawad Kadhim Abood Al Rofai	University of Technology	Iraq
Johan Van der Kwast	UNESCO-IHE, Institute for Water Education	The Netherlands
John Poté	F.-A, Forel Institute- University of Geneva	Switzerland
Kadhim Naief Al Ta'ee	College of Engineering, University of Babylon	Iraq
Kamal Mohammedi	LEMI, M Bougara University	Algeria
Kareem R Al Murshidi	Civil Engineering department Faculty of Engineering University of Kufa	Iraq
Karim Chahid	Laboratoire LAMEC, Faculté des sciences Dhar El Mehraz, Fès	Morocco
Kees Van Der Ree	Coordinator Green Jobs Program, International Labour Organization (ILO). Green Jobs	Switzerland
Khaled Rashed	University of Tripoli, Department of Civil Engineering Tripoli	Libya
Khalid Qahman	Ministry of Environmental Affairs	Palestine
Liefeng Li	Director Freshwater Program, WWF	Switzerland
Mansour Balkhyour	Associate Professor in the Environmental Sciences, King Abdul Aziz University	Saudi Arabia
Mari H. Polfet		
Maria Soledad	Intellectual Property and New Technologies Division, WIPO	Switzerland
Meriem Melghit	Laboratoire de Biologie et Environnement, Université Mentouri de Constantine, Département de Biologie Végétale et d'Ecologie	Alegria



Mohamad Al Robaie	University of Technology	Iraq
Mohamed Alaoui	Head of small and medium dams- Directorate of Hydraulic Works, Ministry of Energy, Mines, Water and Environment	Morocco
Mohamed Salah Abou Ragab	Holder of a Ph.D. entitled" The International Criminal Responsibility of the Heads and Leaders of States	Egypt
Mosaed Abd ElAtty Shetewy	PhD in International Law	Egypt
Najm Obaid Salim Alghazali	Assistant Professor Doctor, civil Engineering Department, Engineering College, Babylon University	Iraq
Nanchoz Zimmermann	Autark Engineering AG	Switzerland
Nino Abuladze	Investment Project Manager at United Water Supply Company Of Georgia	Georgia
Olga Spasic	Head, Innovation Structures Section, Innovation Division, Innovation and Technology Sector, WIPO	Switzerland
Onur Katmerci	Mission of Turkey	Switzerland
Ouerdia Rouibet Boukeur	Faculté des Sciences Biologiques, Université des Sciences Technologiques Houari Boumediene (U.S.T.H.B)	Alegria
Ouzerdine Said	Director, Operating and Maintenance of the Irrigated Areas at the National Irrigation and Drainage Office	Algeria
Patrick Hlabela	Project Manager, EnviroCBA	South Africa
Pervin Yanikkaya Aydemir	Program at Anthropology Department, Yeditepe University	Turkey
Radwa Bakr	Water Research Institute	Egypt
Ruwaya Al Kendi	Biology Department, United Arab Emirates University	UAE
Salah F. A. Sharif	University of Technology, Building and Construction Department	Iraq
Salaheddin Shmela	Tripoli University, Civil Engineering Department, Tripoli	Libya
Saleem Al Zehairi	University of Technology	Iraq
Sameh Habes	Université Kasdi Merbah Ouargla, Laboratoire Ressources en Eau & Développement Durable	Alegria
Senthil Kumar Sadasivam	National College, PG and Research Department of Biotechnology	India
Shams El Din El Hajjaji	Public Prosecutor, Public Prosecution Bureau- Ministry of Justice	Egypt
Smaili Youcef	M'hamed Bougara University	Algeria
Tekle Kandelaki	Ministry of Water	Georgia
Thomas Fitschen	Ambassador, Deputy Permanent Representative, Permanent	Switzerland



	Mission of Germany in Geneva	
Ursula Barter	UN Team Member, INPEA	Switzerland
Walter Wildi	Professor in Geology, University of Geneva	Switzerland
Yesim Baykal	Senior Program Officer, Climate Change and Food Security, Global Challenges Division, Department for Traditional Knowledge and Global Challenges WIPO	Switzerland
Zekri Djihane	Université El Hadj Lekhder Batna	Algeria



### **Appendix III: Dr. Salim's Opening Statement**

The aim of this conference is to challenge and inspire the water and environmental community by sharing knowledge and best practice, which is at the heart of meeting key global challenges. GIWEH-environment conferences are a series of continuous-cycle symposiums, workshops, and conferences aimed at bridging the gap between policy and science in water and environmental management. This year's conference hopes to stress the need for leaders to innovate at different but interrelated dimensions of water and environment management. The objective is to identify patterns of effective leadership for positive change through success stories and trying to bridge the gap between science and stakeholders.

The layout of the conference allows for a significant amount of open dialogue and panels, and we are looking for a highly interactive and open exchange between all participants. Case and country example-based presentations and success stories must be exchanged in order to identify patterns of effective leadership. This meeting is an opportunity for all those who are concerned with water and environment to unite efforts and share experiences so as to draw a practical map of possible solutions, using scientifically accurate and appropriate diagnoses presented at this conference.

We encourage you all to participate in these important discussions with passion and curiosity in order for the conference to be a success. Our goal at GIWEH is not only to address the issues of water, food, energy security, and climate change during this conference, but also to keep the conversation going beyond these three days. We hope to create lasting connections between the very best in the field, in order to find creative and multifaceted solutions to the challenges we face going forward. In order for this to happen, we need to pool all of our resources, both mental and material. We hope that you are all able to use this conference as a vehicle through which to do so.

I would like to take this time to thank the representatives of government, international organizations, academia, NGOs, and private sector representatives that will be participating actively in the coming round-table discussions. It is also my great pleasure to express gratitude and thanks to our partners and collaborators, WIPO, UNESCO-IHE, University of Geneva, Canton of Geneva, and Mohamedmedia School in Morocco. GIWEH also recognizes and appreciates the excellent work by all of those who contributed to the successful preparation and organization of this important event, and remains committed to work closely with our partners to ensure sustainable use and management of water resources.

I thank you again for dedicating this week to teaching, learning, and addressing issues of water, food, energy security and climate change. Your presence in this room is already a symbol of the conference's success. GIWEH will try its best to provide you with a comfortable and convenient meeting environment as well as an opportunity to exchange experience and knowledge. From everyone at GIWEH, thank you.

Hello and welcome to the official opening of the second International Conference on Water Resources and Environmental Management. 2013 is the year of water cooperation in



Geneva, Switzerland, the home of the United Nations Offices in Geneva, so there is truly no better time or place for the second edition of the GIWEH-ICWRE. The staff at the Global Institute for Water, Environment, and Health are truly honored to have you here with us today, to celebrate the strides we as a community have made in the field within the past year, as well as to look ahead at the issues that have yet to be met. We wish you an enjoyable stay in the historic and international city of Geneva.

Our world is ever changing, and I applaud you all for your responsiveness to the challenges we have faced concerning water and environment sustainability. Water, one of the most important natural resources that we are charged with protecting, is connected to power, politics, and socio-economic trends, all in addition to the massive ways its condition can and will affect our environment.

Today, the world suffers from severe water problems caused by global changes including population growth, migration, rapid urbanization and climate change. This will have a direct influence on food security, health, economic growth, and poverty alleviation. We all have a role to play in ensuring that the world we pass down to future generations is a clean, sustainable, and healthy one.

I am truly honored to be in the company of over 150 scholars, ambassadors, and entrepreneurs that care deeply about the contemporary issues of water, food, energy security and climate change. All of us at GIWEH are inspired by your dedication and are pleased to spend the next three days learning with and from you.





## Appendix IV: Keynote Speeches

*(Continued summary from Ms. Ann Tutwiler's speech, Day 1, Session 1):*

Ms. Tutwiler focused her speech on the link between water scarcity and food security, given that all food requires water, which comes from either rain or bodies of fresh water. Irrigated agriculture contributes 40% of global food production, and it takes between one and three tons of water to produce only a kilogram of cereal. On an individual level, the food consumed by the average person per day took an average of 3,000 liters of water to produce. Given these numbers, it is easy to see how water scarcity directly affects undernourishment and food insecurity in the developing world.

While it is logical that water use would increase as the population increases, the average water usage has increased at nearly double the pace of population growth. Development across the world has also proven to strain our already scarce water resources. Climate change is expected to further deplete the water supply as draughts become more and more common. By 2020, yields from rain-fed agriculture are expected to be reduced by nearly 50% in some African countries lacking irrigation capabilities, which poses a major threat to water and food security in these areas.

Rural communities are especially vulnerable to the affects of water scarcity, as one can see in the Horn of Africa, where 13 million people were affected by a draught in 2011. Water scarcity also affects food prices, as evident in Somalia, where cereal prices rose 260% as a result of draught. These staggering prices cut deep into the security and well-being of rural societies. Draught has a direct effect on growth rates of children, as well as the security of livestock, which serves as the source of livelihood in some rural communities. In some cases, draught can reduce livestock population by 50%.

*(Continued summary from Mr. Christian Wichard's speech, Day 1, Session 1):*

Given that water is the basis for human life, water is at the heart of many of the global challenges the world is currently facing. Global health, climate change, energy, and economic development all depend on a secure water supply. However, given that water is a finite and international resource, the governance of water requires trans-border cooperation, making it a global responsibility. The ultimate goal, according to Wichard, is to provide access to safe drinking water to all people. Given the imminent population growth expected by 2050, which expects to see an increase of nearly two billion people, Mr. Wichard believes that the time to find solutions to the water problem is now.

According to Mr. Wichard, one solution lies in technology and efficient access to existing technology. Technology is responsible for efficient water use and irrigation technologies, as well as efficient water treatment and providing access to fresh water. Given these truths, it is apparent that innovations for new water technologies are in high demand. Innovation, according to Mr. Wichard, must occur through cooperation across the boundaries of public and private, as well as international lines. Current technologies must be available for improvements and to serve as a basis for future innovation. Above all, these partnerships and innovations must be managed and made accessible, which is the role that WIPO may play in the future of water.



*(Continued summary of H.E. Ambassador Hyo-Sung Park's speech, Day 1, Session 1):*

H.E. Ambassador Park began by noting that almost 60% of the human body is made of water, highlighting the basic necessity human beings have for safe, fresh water. Water, he says, is as essential as air for the sustenance of life, and is directly connected to food, climate change, the health of ecosystems, and so on. Various stakeholders must be 'reawakened' to the importance of new water innovations in order to address the immanent problems concerning water that we as humans will face in the coming years. The public and various stakeholders must be reminded and educated about the importance of the nexus between water and environmental change, and this activism will directly affect the world that we leave for the next generation.

Support for the cause of water resources and management must be strengthened and broadened. 11% of the global population, or 1 in 9 people, do not have access to safe drinking water. By 2015, this number is expected to grow to 1 in 3 people that live in countries with moderate to high water stress. H.E. Ambassador Park believes that the solution lies in finding new ways to recycle wastewater, creating methods of efficient water use, and reducing water pollution. Water resources and environmental management should go hand in hand, so that the international community can effectively advance its common goal of sustainable development.