## TIP Platform Session Report
### Technology, Implementation, Policy Platform

<table>
<thead>
<tr>
<th>Focus area</th>
<th>Session Title</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart Water Management</td>
<td>New strategies on Urban Flood Management under Climate Change</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Smart Water Grid technology with diversification of water resources</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Smart Water Management Platform: IoT-Based Precision irrigation for Small and Medium Scale Farmers</td>
<td>8</td>
</tr>
<tr>
<td>Water Recycling and Reuse</td>
<td>Youth Perspectives: Water Research and Initiatives</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Water Recycling and Reuse ; The way from Non-conventional to Conventional Sources in Jordan Case</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Unconventional Water Resources in Dry Areas for Sustainable Development</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Capacity building of water reuse</td>
<td>19</td>
</tr>
<tr>
<td>Water for Socio-economic Development</td>
<td>Improving Water Security for the Sustainable Development Goals</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Global Support for Victims - Africa’s Rising Water Crisis and Mitigation Desertification</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Towards the 9th World Water Forum: why is water quality such a crucial component in the water security equation?</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>The Revolutionary Sustainable Finance Scheme to Tackle Water Crisis in Lombok, Indonesia</td>
<td>30</td>
</tr>
<tr>
<td>Water Governance and Partnership</td>
<td>Using SDG 6 Policy Support System (SDG-PSS) to facilitate Countries in the Asia region for water-related sustainable development</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Global Implications and Lessons for Good Water Governance Systems at the River Basin Level in Korea</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Regional Collective Action on “Cooperation” : towards the 9th World Water Forum</td>
<td>40</td>
</tr>
<tr>
<td>Water ODA</td>
<td>Revising Water ODA in the view of Sustainability</td>
<td>42</td>
</tr>
</tbody>
</table>
**Date/Time/Venue**  September 4 (Wed) / 16:30-18:30/#322B (3F), EXCO

**Organizer**  Korea Water Resources Association(KWRA), KNU(Kyungpook National Univ)

**Session title**  New Strategies on Urban Flood Management under Climate Change

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**Program**

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:30-16:35(5’)</td>
<td>Opening remark</td>
<td>Prof. Kun Yeun Han&lt;br&gt;KWRA (Korea Water Resources Association) and&lt;br&gt;KNU (Kyungpook National Univ)</td>
</tr>
<tr>
<td>16:35-16:55(20’)</td>
<td>Assessment of flood hazard zoning for disaster mitigation</td>
<td>Prof. Gwo Fong Lin&lt;br&gt;National Taiwan University</td>
</tr>
<tr>
<td>16:55-17:15(20’)</td>
<td>On the estimation of flood damage occurred by heavy rainfall and storms</td>
<td>Prof. Hung Soo Kim&lt;br&gt;Inha University</td>
</tr>
<tr>
<td>17:15-17:35(20’)</td>
<td>Overcoming lack of data for flood hazard assessment: Cost effective high quality DEM and rainfall proxies</td>
<td>Prof. Shie-Yui Liong&lt;br&gt;National University of Singapore</td>
</tr>
<tr>
<td>17:35-17:55(20’)</td>
<td>Urban flash flood warning system using dual-polarization radar</td>
<td>Dr. Seokhwan Hwang, Dr. Dongryul Lee&lt;br&gt;KICT (Korea Institute of Civil Engineering and Building Technology)</td>
</tr>
<tr>
<td>17:55-18:15(20’)</td>
<td>Development of a distributed hydrological model for near real time flood forecasting using extended Muskingum method</td>
<td>Prof. Gwangseob Kim&lt;br&gt;Kyungpook National University and&lt;br&gt;Director, Disaster Prevention Research Institute, KNU</td>
</tr>
<tr>
<td>18:15 - 18:30(15’)</td>
<td>Panel Discussion</td>
<td>5 Panelists</td>
</tr>
</tbody>
</table>

**Results**

**Presentations**

- **Assessment of flood hazard zoning for disaster mitigation (Gwo Fong Lin, National Taiwan University)**
  - Regarding the model input, the proposed model of flood hazard zoning with the flood susceptibility values of the self and surrounding grids do improve the assessment performance.
  - The proposed model “RF-SOM” can produce reliable flood hazard zoning maps.
  - The land use, distance to drainage channel, elevation, slope and the maximum 1-hour rainfall have great influence on flood hazard zoning.

- **On the estimation of flood damage occurred by heavy rainfall and storms (Hung Soo Kim, Inha University)**
  - This study suggest improvement method for 5 type flood losses such as building, vehicle, crop, and casualty/victims.
  - Building damage and losses: The unit of analysis used individual building objects and CSVR concept was used to determine building contents value. This research developed building vulnerability curve using various data such as damage survey data, claim data, and expert opinions.
  - Vehicle damage and losses: It was included as a new type of loss not covered previously, and analysis procedure was proposed.
  - Crop damage and losses: It’s changed assessment criteria and representative 10 crops, and updated unit required for assessment.
  - Life losses (Casualty, victims): The PAR concept was used and analysis procedure was proposed based on occurrence probability.

- **Overcoming lack of data for flood hazard assessment: Cost effective high quality DEM and rainfall proxies (Shie-Yui Liong, National University of Singapore)**
  - This study presented and demonstrated: (a) a cost-effective and high quality DEM improvement scheme; (b) reasonably reliable rainfall proxies resulting from regional climate model.
The in-house developed Improved SRTM DEM technique showed visually much clearer drainages, roads, buildings, etc than their counterparts in SRTM DEM; similarly, it is more superior than the German Aerospace DLR’s TanDEM-X (Euros 30/km2). The DEM improvement technique was demonstrated in various dense urban areas.

ANN trained in Nice (France) generates more accurate DEMs in Singapore and Greater Jakarta than their counterparts SRTM DEMs.

Improved DEM and derived IDF curves were then applied to flood risk assessment study, using Mike21 FM, in Greater Jakarta. The resulting generated flood maps by ANN are useful for flood mitigation measures.

**Urban flash flood warning system using X-band dual-polarization radar (Dongryul Lee, Korea Institute of Civil Engineering and Building Technology)**
- Strengthen the pre-flood response abilities by providing flood risk prediction reflecting characteristics of local authorities
- Develop the local sized flood and dynamic flash flood forecasting technologies
- Develop a high performance(HPC) numerical model for spatial-temporal flood prediction on river watershed and HPC flood forecasting platform based on real-time flood location

**Development of a distributed hydrological model for near real time flood forecasting using extended Muskingum method (Gwangseob Kim, Kyungpook National University)**
- Develop a distributed hydrologic model for near real time flood forecasting using extended Muskingum method
- Improve the model accuracy applying multi-site calibration
- Results showed the possibility of near real time flood forecast for major tributaries using the distributed hydrologic model.
- Results showed the possibility of reasonable near real time flood warning information in urban area. However, there is large room to improve the model accuracy.

**Discussion**

**Results**
- The results of this session are to address the various approaches and methods used to predict and manage on Typhoon and flood disaster during recent years.
- It will contribute to exchanging advanced experiences in the areas of integrated flood management and implementation.
- By sharing of new, innovative developments in Typhoon(Hurricane) and flood risk reduction methodologies especially in large urban areas, we could explore countermeasures to sustain balance between structural and nonstructural approaches.

**Major messages**
- It is very important to build a resilient society against flood disaster in urban areas, and to perform ICT application for the efficient integrated flood management and implementation. The major messages and outcomes are summarized as follows.
- Qualitative and quantitative methods for rainfall/flood forecasting, mapping and mitigating the flood-related disasters are very important for enhancing flood resilience against climate change
- Integrated flood management should be established for building a resilient society
- Combination of engineering measures with social, financial and legal aspects for flood mitigation are should be made within interconnected social system
- New technologies should be continuously adopted for preparing, forecasting and managing flood disasters.

**Photos**

Presentation by Prof. Lin  
Presentation by Prof. Kim, Gwangseob
<table>
<thead>
<tr>
<th><strong>Presentation by Prof. Liong</strong></th>
<th><strong>Presentation By Prof. Kim Hung-Soo</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discussions</strong></td>
<td><strong>Discussions</strong></td>
</tr>
</tbody>
</table>
Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:30 - 09:50(20’)</td>
<td>Prospects for Developing “Smart Water Grid” Projects in the Northern Area of Vietnam</td>
<td>Mr. Nguyen Chi Nghia, Vice Director General of National center for Water resources Planning and Investigation, Vietnam</td>
</tr>
<tr>
<td>09:50 - 10:10(20’)</td>
<td>Potential for Smart Water Implementation in Indonesia</td>
<td>Mr. Danang Hadisuryo, Deputy Director of Ministry of Public Works and Housing, Indonesia</td>
</tr>
<tr>
<td>10:10 - 10:30(20’)</td>
<td>A Brief History of Water Resources Policy in Japan, and its Recent Developments</td>
<td>Mr. Tatsuo Hamaguchi, Adviser of Hazama Ando Corporation, Japan</td>
</tr>
<tr>
<td>10:30 - 10:50(20’)</td>
<td>How Water Authorities Apply Water Sector Strategy and CIP on Our Projects/Studies</td>
<td>Eng. Samaher Al Akhrass, Assistant Secretary General of Water Authority of Jordan (WAJ), Jordan</td>
</tr>
<tr>
<td>10:50 - 11:10(20’)</td>
<td>Strategy and Implementation of Smart Water Grid in Korea</td>
<td>Prof. SangHo Lee, Professor of Kookmin University, Korea</td>
</tr>
<tr>
<td>11:10 - 11:30(20’)</td>
<td>Korea’s Water Management Outlook and Role of the Government</td>
<td>Dr. JinSuk Suh, Senior Researcher of K-Water Institute, Korea</td>
</tr>
<tr>
<td>11:30 - 12:00(30’)</td>
<td>Group Discussion</td>
<td>Dr. Park Snag Young, Water Resources and Project Management Specialist of Asian Development Bank, Indonesia</td>
</tr>
</tbody>
</table>

Results

Presentations

- **Prospects for Developing “Smart Water Grid” Projects in the Northern Area of Vietnam (Mr. Nguyen Chi Nghia, National center for Water resources Planning and Investigation, Vietnam)**
  Mr. Nguyen was absent.

- **Potential for Smart Water Implementation in Indonesia (Mr. Danang Hadisuryo, Ministry of Public Works and Housing, Indonesia)**
  Mr. Danang introduced status of national water management and current water issues in Indonesia. He explained about future plan, policies, strategies and priorities set by the Indonesian government. New project development and implementation procedure is to be followed was also discussed and finally, he concluded with desired field of cooperation with SWG Korea.

- **A Brief History of Water Resources Policy in Japan, and its Recent Developments (Mr. Tatsuo Hamaguchi, Hazama Ando Corporation, Japan)**
  Mr. Hamaguchi explained about Japan’s Recent Water Policy and Development Status. He also talked on status of waterworks and recently applied technology. Japan’s water supply modernization plan, water related government and local government’s role was also put in discussion. At the end of his presentation he pointed out the possible desired filed of cooperation with Korea.

- **How Water Authorities Apply Water Sector Strategy and CIP on Our Projects/Studies (Eng. Samaher Al Akhrass, Water Authority of Jordan (WAJ), Jordan)**
  Ongoing and proposed projects in Indonesia with multi-water resources usage and ICT Technologies, annual water sector investment amount and finance source (government, MDB, ODA, PPP) were introduced by Eng. Samaher. She also briefly explained about new project development and implementation procedure and internal approval procedure for registration in national project list. Finally, she highlighted current priorities for water management system improvement.
in Indonesia by application of smart water management technology.

- **Strategy and Implementation of Smart Water Grid in Korea (Prof. Lee Sang Hoe, Kookmin University, Korea)**
  Prof. Lee presented about Strategy and Implementation of Smart Water Grid in Korea. He also explained about the key technologies that are being used by NSSWGRG, Korea. He showed the demonstration plant of implementing SWG as well. Finally he raised some key restraints against SWG.

- **Korea's Water Management Outlook and Role of the Government (Dr. Suh Jin Su, K-Water Institute, Korea)**
  Final speaker of the session Dr. Suh talked about the K-water’s case studies on implementation of Smart Water Management in Korea.

**Discussion**

- **Results**
  The TIP Platform successfully made global discussion on practical solutions to SWG at various scales and provided practical and innovative guidelines for those who seek for practical know-hows and lessons resulted from successful implementation of SWG. The TIP Platform was able to share professional experiences from different countries about the latest technologies and methodologies (Sensors, AMI, AI, IoT, big data etc.), and to share best practices and research advances in the field of SWG technology (Focusing on use of multi-water resources).

- **Major messages**
  Participants agreed on developing Smart water networks for collective action based on international cooperation and provided practical advice for the future projects and collaborative works. In addition, the participants and speakers highlighted the issues on SWG implementation with possible solutions in developing and managing water resources, and agreed on significance of common responsibilities of all stakeholders in contribution to SWG field and its implementation.

- **Others**
  4 international and 2 domestic renowned experts were invited as speakers from different organizations, academia, institutions, corporations and more than 40 participants actively participated in the session. Session organizer, speakers and participants shared their ideas and thoughts on appropriate and innovative technologies as well as diversification of multi water sources, a key technology of SWG.

**Photos**

- Participants of the session
- Mr. Danang (Indonesia) presenting his presentation
Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:30-14:40 (10')</td>
<td>Opening remark</td>
<td>Dr. Hossein Dehghanisanij, Associate professor, Agricultural Engineering Research Institute, AERI, Agricultural Research, Education and Extension Organization, AREEO, Iran</td>
</tr>
<tr>
<td>16:40-17:10 (30')</td>
<td>Water use challenges in small and medium-scale farms/ Advantages of IoT by examples and application in Urmia River Basin</td>
<td>Dr. Hossein Dehghanisanij, Associate professor, Agricultural Engineering Research Institute, AERI, Agricultural Research, Education and Extension Organization, AREEO, Iran</td>
</tr>
<tr>
<td>17:10-17:40 (30')</td>
<td>Introduction to FruitLook: eLEAF &amp; PiMapping, A services to improve the water use efficiency</td>
<td>Dr. Ali Mohammad Sharifi, X-associate professor, ITC, University of Twente, the Netherlands</td>
</tr>
<tr>
<td>17:40-17:10 (30')</td>
<td>The use of smart technologies and institutions for small-scale irrigation schemes in Southern Africa</td>
<td>Prof. Henning Bjornlund, University of South Australia, Adelaide, South Australia, Australia</td>
</tr>
<tr>
<td>18:10-18:30 (20')</td>
<td>DISCUSSION</td>
<td>All speakers</td>
</tr>
</tbody>
</table>

Results

Presentations

- Water use challenges in small and medium-scale farms/ Advantages of IoT by examples and application in Urmia River Basin (Dr. Hossein Dehghanisanij, Agricultural Engineering Research Institute, AERI, Agricultural Research, Education and Extension Organization, AREEO)

This presentation introduced the importance of the agricultural sector as the main water user and raised up the challenges related to the small and medium landowners regarding water management. An application by name of AgriHydro introduced which is based on crop soil-crop-water relationships. An idea to bring different research outputs to the farmers land rather than just water. Accordingly, the farm specification monitor and irrigation scheduling deliver to the farmers. It does not cost for farmers and could handle by all the farmers. AgriHydro was applied in tomato and grape farm in Urmia Lake Basin in farmers farm and showed water use by farmers decreased significantly compared to the farmers' experience application.

- Introduction to FruitLook: eLEAF & PiMapping, A services to improve the water use efficiency (Dr. Ali Mohammad Sharifi, ITC, University of Twente)

This presentation briefly introduced PiMapping and its potential application in the smart management of natural resources, in particular water resources. Furthermore, it presented/demonstrated Fruitlook system which is an example of real application of satellite-based system in the management of Horticulture, in South Africa.

- The use of smart technologies and institutions for small-scale irrigation schemes in Southern Africa (Prof. Henning Bjornlund, University of South Australia)

This presentation reported on the introduction of a two-pronged approach to improving the productivity and profitability of small-scale irrigators and their irrigation schemes in Southern Africa. The two prongs of the approach were the introduction of smart water management technologies in the form of soil moisture and nutrients monitoring tools to facilitate farmer learning about the soil nutrients and moisture dynamics to improve farmers decision making around irrigation and fertilizer management. The second prong was the introduction of smart institutions to facilitate that the learning from the tools are translated into changed behavior and to identify and help resolve other barriers to improved productivity and profitability such as the supply of better quality inputs such as improved seed, chemicals and fertilizer to improve yield and facilitate a better integration of farmers into the value chain and linking them to markets to facilitate that the increased productivity is turned into increased profitability.
Discussion

The objective of this platform was to contribute in introducing implemented IoT that adequately meet the needs of small and medium-scale entrepreneurial farmers to increase water productivity in agriculture, and increased income and food security to have secured water access for agriculture production and become more resilient to climate change. Three different techniques were introduced; AgroHydro, Fruitlookm, and smart technologies and institutions for small-scale irrigation.

- **Results**
  - AgriHydro application could improve the irrigation water management by farmers and water application by farmers decreased significantly compared to the farmers experience application.
  - Demonstration of a real application of satellite-based information system supporting farmers in managing their water and horticultural resources in a user-friendly and economically affordable fashion. Such data can not be easily available in an operational manner using conventional systems.
  - Satellite-based technology has become available to provide real-time information on the complex processes that are taking place in the surface of our plant, in a user-friendly and economically affordable fashion. This information can be used to support management of our natural and water resources at local and regional levels.
  - Farmers responded very quickly to the learnings from the tools. The learned that overirrigation resulted in leaching of fertilizer below the root zone so that their crops could not benefit from the plant food. Hence the reduced the number of irrigation events during the season. They also reduce the time the irrigated. This led to immediate significant yield increases.
  - Farmers also quickly experience that by irrigating less they also saved time, which is probably the scarcest resource for small scale farmers in southern Africa. They invested this time bout in on-farm and off-farm activities.
  - Under technology application, extension officers reported that they have never seen the fields so clean of weeds as farmers used some of the saved time for weeding. Less weeds reduce the competition for both water and nutrients and further increased yields.
  - They also used the time to diversify their income stream by starting small businesses such as hairdressing, baking and the making of mud bricks. This provides important cash income to buy more input which in turn also increases yield.
  - Apart from improving the livelihood of small-scale farmers, all introduced tools are also WIFI enabled and uploads the data to the clouds. As such, they generate a meta-database of real in-time farm/farmer level information on water use, yields and gross margin, from across the world. Such databases will have significant value for water planter and funders both a local, national and global level. However, for the tools to provide this data on an ongoing basis, smart institutions are also needed to ensure that the tools are correctly installed, used and maintained and they are fixed when broken. Without such institutions or processes in place the use of these tools will cease or the data uploaded will be inaccurate.

- **Major messages**
  - Agricultural is the main water user in all the countries and must be considered in any activity regarding less water use and improving water use efficiency.
  - An important message for policymakers considering investing in new irrigation schemes or rejuvenating existing schemes is that simply addressing technical issues and investing in hardware will not resolve the issues related to underperforming irrigation schemes. It is critical to also resolve the other issues which present barriers for farmers to increase their productivity and profitability such as market access, transport, knowledge, and finance.
  - For people intending to introduce smart water management technologies in developing countries the introduced projects illustrate the importance of introducing smart institutions parallel with smart technologies to ensure that the technologies are adopted, used and maintained so they have intended impact both for the individual and institutional users.

- **Others**
  - The satellite-based technology can be combined with actual measured field data and produce a very powerful means to provide reliable and affordable data supporting management of our natural resources.
Photos

[Images of people giving presentations and audience members]

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10
### Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:00 - 13:05 (5’)</td>
<td>Masters of ceremony</td>
<td>Ms. Alifta Farisa Zulfa&lt;br&gt;Mr. Muhammad Agung Sedayu</td>
</tr>
<tr>
<td>13:05 – 13.10 (10’)</td>
<td>Opening remark</td>
<td>Mr. Salman Faris Al-Faritsi (IGAF IPB University)</td>
</tr>
<tr>
<td>13:10 – 14:20 (70’)</td>
<td>Wastewater recycle and reuse research, initiatives, and project in different sectors</td>
<td>1. Prof. Shahbaz Khan (Director of UNESCO Asia-Pacific)&lt;br&gt;2. Prof. Amanda Loeffen, (Director General of WaterLex)&lt;br&gt;3. Prof.Chihwan Kim (Lecturer of Youngsan University)</td>
</tr>
<tr>
<td>14:20 - 14:40 (20’)</td>
<td>Moderating the above discussion (Question and Answer Session)</td>
<td>Dr. Achmad Solikhin&lt;br&gt;(ASEAN Secretariat/SEAMEO BIOTROP)</td>
</tr>
<tr>
<td>14:40 - 15:30 (50’)</td>
<td>5-10 selected Indonesia and Korea students with their research and studies on wastewater treatment</td>
<td>1. Ms. Ummu Salamah Khoiriyah, BSc (BPDPKS/IPB University Indonesia)&lt;br&gt;2. Ms. Ike Mediapati, BSc, MSc (Ministry of Environment and Forestry Indonesia)&lt;br&gt;3. Mr. Anthony Harlly Sasono Putro, BSc, MSc (Ministry of Public Works and Housing Indonesia)&lt;br&gt;4. Mr. Sandeep Basu, BSc, MSc (Yeungnam University, ROK)&lt;br&gt;5. Mr. Muhammad Ridho Saputra Sanurbi, BSc (IPB University, Indonesia)&lt;br&gt;6. Mr. Ahmad Farub (Yeungsan University, ROK)</td>
</tr>
<tr>
<td>15:30 - 15:40 (10’)</td>
<td>Moderating the above discussion (Question and Answer Session)</td>
<td>Ms. Syifa Fatimah, BSc (Diponegory University)&lt;br&gt;Mr. Supandi Hermawan (IPB University)</td>
</tr>
<tr>
<td>15:40 – 16:00 (10’)</td>
<td>Closing remark, photo session, and mementoes</td>
<td>Ms. Menik Dewi Salindri (Youngsan University, ROK)</td>
</tr>
</tbody>
</table>

### Results

**Presentations**

- Prof. Shahbaz Khan, PhD: Prof. Khan is the Director of UNESCO Asia-Pacific Jakarta. He presented a presentation entitled Water: Security: A Multi-stakeholder Engagement Challenge. Water Security should include three components, such as human security, socio-economic security, and ecologic security. He also presented about Integrated Water Resources Management (IWRM) referring to as the way to manage water resources in a harmonious and environmentally sustainable manner by gradually uniting stakeholders. He also stressed that water is at the heart of sustainable development affecting social, economic, and environmental sustainability. His presentation material appears at Annex 1.

- Amanda Loeffen, BSc, MSc: Ms. Amanda Loeffen is the Director General of WaterLex; and he delivered a presentation entitled Sustainable Sanitation, Water Governance, and Human Rights. Her institution has a mission to secure the human rights to water and sanitation through law and policy reform. She told that water is a human right, and human right based approach (HRBA) is designed to further the realization of human rights with consisting of structural frameworks, procedural, and outcomes. HRBA to water should comprise participation, accountability, non-discrimination and equity, transparent, and empowerment. Her presentation material appears at Annex 2.

- Prof. Chihwan Kim, PhD: Prof. Chihwan Kim is the Assistant Professor of Youngsan University, South Korea, ROK. He presented about the story telling of Water as the Source of Life. By using a story of a 14-year-old middle school girl went missing in ROK, he interlinked the utilization of water to her survivor during her missing. Besides that, he explained that...
there are three legal systems in ROK on regulating water, such as up, down, and in the middle. His presentation material appears at Annex 3.

Besides the presentation of these above distinguished speakers, there were also some initiatives and projects on water presented by selected young students, studying in ROK and Indonesia. They were:

- **Ms. Ike Mediawati** representing University of Sungkyungwan, ROK: She presented the partial nitrification by using PVA/alginate immobilized-cells. That presentation pertained the removal of nitrogenous compounds from wastewater systems prior to its disposal as an important issue. Her presentation material is in Annex 4.

- **Mr. Sandeep Basukala** representing University of Youngnam, ROK: He presented the economic value of Begnas Lake by using travel cost method. As his presentation summary, for better consumer surplus, maintenance of ecosystem services like fresh water, boating and tourism infrastructures like trail, trail light, view tower, boating centre needed to be built; and visitation records have to be managed. His presentation material appears in Annex 5.

- **Mr. Antony Harlly Sasono Putro** representing University of Sungkyungwan, ROK: He presented about Nusa Dua Beach erosion. As a conclusion, based on the shoreline, area, and volume changing rate calculation, beach erosion was occurred at some parts of Nusa Dua Beach. Based on the simulation, after beach nourishment, due to some processes, the beach tried to make the equilibrium condition (shoreline and beach profile). His presentation appears in Annex 6.

- **Mr. Ahmad Farub** representing Youngsan University, ROK: He presented about water purification method by utilizing carbon nanoparticles blended with electrospun chitosan polymers. The electrospun membranes would be beneficial to remove heavy metals and to inhibit the growth of bacteria. His presentation material appears in Annex 7.

- **Mr. Muhammad Ridho Sanurbi** representing Bogor Agricultural University, Indonesia: He presented about the utilization of bamboo for water preservation. Some species of bamboo have been identified as water storage, furnitures, food, and bioenergy. His presentation material appears in Annex 8.

- **Mr. Ummu Salamah Khairiyah** representing Bogor Agricultural University, Indonesia: She presented the importance of chitosan/carbon nanoparticles to remove heavy metals and to kill bacteria. The addition of carbon nanoparticles could enhance the properties of the hydrogels. Her presentation appears in Annex 9.

### Discussion

**Results**

There were about 50 attendees or participants who attended this Platform. The participants were from the UN agencies, governmental sectors, private sectors, university, local people, and young people. During this Platform, there were gobs of questions proposed to guest speakers who presented their presentation. In this Platform, there were two sections in which every presenter delivered his/her presentation for about 15 min per each. In this report, we will describe in detail of his/her presentation, and what will be the major outcomes that are beneficial as a reference for the next KIWW 2020 or the 9th World Water Forum.

In this Platform, we attempted to engage many young people to be more pro-active to help actualize some solutions into implementable and sustainable actions. Not only just problems or challenges but also solution and implementation for water issues are really needed. In addition, the young can be more active to accelerate Integrated Water Resources Management (IWRM), and use the decent rights to achieve IWRM. Most of the presentations benefited nature-based solutions to tackle water issues affecting the world, such as the utilization of biopolymer for water recycle and reuse, the utilization of trees or bamboos for water storage, and so forth.

**Major messages**

There were three major messages extracted from this TIP Platform:

1. Water research and initiatives of young people must be actualized in the ground (implementable and sustainable), and not only just solutions;
2. The results of this TIP Platform must be utilized for the next agenda of KIWW 2020, and the results can be benefited for the imperative matters in the High-Level Panel Meeting in KIWW and other water forums;
3. Private and public sectors must invest young people’s research and initiatives, and help translate these regards into implementable actions beneficial for better future.

**Others**

The organizers expect that young people must be involved in every single activity of TIP Platform because they have voices and initiatives, which can be used for tackling water issues. Aside the above, youth must be engaged in the policy making so that their voices are not marginalized.

Photos

Prof. Shahbaz Khan’s Presentation

Participants of IGAF’s TIP Platform

Second Session Participants: Youth Presentations

Recommendation in Q&A of Regional Coordinator for Global Water Partnership Southeast Asia

Session Organizers’ Photo

Q&A Session
**Date/Time/Venue** 5 September, 16:00 – 18:00, room 321B

**Organizer** Jordan Wastewater Reuse Organization (JWSRO)

**Session title** The way from nonconventional to conventional sources (The Case of Jordan wastewater Reuse)

## Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:00-16:05</td>
<td>Opening remark</td>
<td>Dr. Luay Froukh (JWSRO director)</td>
</tr>
<tr>
<td>16:05-16:35</td>
<td>Jordan Water Recycling and Reuse Stagey</td>
<td>Dr. Luay Froukh (JWSRO director)</td>
</tr>
<tr>
<td>16:35-17:10</td>
<td>Wastewater Reuse Building a Secure World</td>
<td>Joel Kolker (WB Program Manager)</td>
</tr>
<tr>
<td>17:10-17:45</td>
<td>Wastewater Reuse for Community livelihood enhancement and Social Stabilization</td>
<td>Dr. Luay Froukh (JWSRO director)</td>
</tr>
</tbody>
</table>

## Results

### Presentations
- **Jordan Water Recycling and Reuse Stagey.** Dr. Luay Froukh (JWSRO director)
  - Jordan water and wastewater challenges
  - Impact of Geopolitical situation on water sources
  - Wastewater reuse become conventional source
  - Jordan reuse strategy

- **Wastewater Reuse Building a Secure World.** Joel Kolker (WB Program Manager)
  - Building block for wastewater reuse market
  - Examples on wastewater reuse from Namibia, Spain, Singapore, Mexico
  - Scaling up wastewater reuse

- **Wastewater reuse for community livelihood enhancement.** Dr Luay Froukh (JWSRO director)
  - Wastewater reuse as a source of livelihood and development of Wadi Musa community
  - Impact of reuse on socioeconomic and environment in Wadi Musa
  - Challenges facing local community in project sustainability

### Discussion
- **Results**
  - Wastewater reuse can be considered as conventional source in scarce water countries
  - Efficient utilization of reuse water can contribute to development of rural communities and improve the environment
  - Awareness on reuse as an important source of water supply will contribute to acceptance of more users in the local communities
  - Technology can help in improving water quality of treated wastewater to high levels
  - Wastewater reuse become worldwide contributes to world security

- **Major messages**
  - More efforts needed in countries with limited sources to use reuse water and invest in wastewater treatment
  - Countries need to modify their regulations to allow for use if reuse water in irrigation and landscaping to save fresh water sources for other purposes
  - Invest in new technology and smart systems to improve reuse efficiency and quality monitoring
Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00-10:45 (45’)</td>
<td>Welcome remarks and presentation</td>
<td>Mr. Manzoor Qadir, Assistant Director, UNU-INWEH</td>
</tr>
<tr>
<td>10:45-11:30 (45’)</td>
<td>Moderated Panel Discussion</td>
<td>Ms. Eunhae Jeong, Senior Development Management Expert, UNOSD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mr. Ick Hoon Choi, Vice President, K-eco</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ms. Aslıhan Kerç, Project Development and Implementation Coordinator, Turkish Water Institute</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mr. Muhammad Ashraf, Chairman, Pakistan Council of Research in Water Resources</td>
</tr>
<tr>
<td>11:30-11:45 (15’)</td>
<td>Open Discussion</td>
<td>Open discussion stemming from panelists’ contributions and audience</td>
</tr>
</tbody>
</table>

Results

Presentations

- **Unconventional Water Resources in Dry Areas for Sustainable Development**
  - Water resources and population densities are unevenly distributed across the world. More than two-thirds of the global population is expected to face water scarcity by 2030 (by the end of the SDG era)
  - The conventional water resources – rainwater, snowmelt and river runoff – are not enough to meet water demand in water-scarce areas.
  - Water-scarce and communities need to consider alternatives – unconventional water resources (UWR) – to narrow demand-supply gap. UWR include:
    - Used water (urban, agricultural).
    - Desalinated water.
    - Groundwater.
    - Atmospheric water capture.
    - Transported water, iceberg towing.
  - Unknowns about UWR:
    - Global and regional status and potential of most UWR
    - Future scenarios and projections.
    - Fate of certain UWR such as long-distance iceberg towing.
    - Comprehensive economic analysis for some UWR.
    - Quantification on how far UWR can narrow water-demand supply gap at different scales.
    - Specific contribution of UWR to achieving SDG 6 and its certain targets.
  - Fog water collection:
    - There are fully operational fog water collection plants in the dry areas, the largest being in Morocco. However, there are no policies to promote or facilitate fog water collection in dry areas where fog events and intensity are conducive for fog collection systems.
    - Community and gender mainstreaming in fog collection systems bring positive outcomes for women and girls.
  - Water desalination:
    - There are more than 15000 desalination facilities in more than 100 countries. Half of the global desalination capacity is in the MENA region. High-income countries are responsible for around 70% of total desalinated water.
    - Business-as-usual practices are not considering the brine being produced and disposed on ocean water. Unclear amount of brine being produced by desalination plants. Methodology used to assume 1:1 ratio, which is not representative of actual brine being produced.
  - Municipal wastewater:
    - 380 billion m² of wastewater being produced worldwide (almost 5 times the annual volume of water that passes through Niagara Falls). Expected to reach 470 billion m² by 2030 and 574 billion m² by 2050.
Discussion

- **Ms. Eunhae Jeong**
  - Unconventional water resources can play a key role in achieving SDG 6. Four years have passed since the adoption of SDGs and this year will be marked by the high-level summit on climate in October.
  - The rate of population using at least basic water supply increased on the 2000-2015 period, however there is need to accelerate progress.
  - Integration approach is required to deliver on SDGs, and this is a lesson learned from MDGs. For instance, SDG 6.6 on ecosystems is related to SDG 14 (ocean) and SDG 6.4 on water efficiency is related to SDG 10 (responsible consumption).

- **Mr. Ick Hoon Choi**
  - K-eco has a lead role in the water sector and aims to become a global leader organization. Among its strategic targets, K-eco focus on:
    - Quality control and toxic elements control.
    - Promotion of water reuse in Republic of Korea.
    - Promotion of public-private partnership.
    - Operation of small-scale desalination plants; and thinking beyond SDGs already.

- **Ms. Aslıhan Kerç**
  - By 2030, Turkey aims to increase the level/quality of water treatment. The country is already experiencing less rainfall and wastewater is considered an alternative resource for water supply. Wastewater treatment is also considered a source of nutrients and energy.
  - Big water treatment plans are not sustainable anymore (pumping wastewater to far away treatment plants and pumping treated water back to where it is needed is a costly practice). Turkey is looking for delocalized water treatment plants, specially for small communities.

- **Mr. Muhammad Ashraf**
  - Pakistan has one of largest irrigation system in the world. However, the country also experiences a serious problem with water scarcity. Three problems can be identified:
    - Development issue in Pakistan and lack of water storage (groundwater is major water source).
    - More than 60% of water is lost by leakages.
    - Water governance (water required by agriculture adds pressure on water supply for other purposes such as drinking water).

**Major messages**

- The conventional water resources – **rainwater, snowmelt and river runoff** – are not enough to meet water demand in water-scarce areas. Water-scarce and communities need to consider alternatives – **unconventional water resources** (UWR) – to narrow demand-supply gap.
- The rate of population using at least basic water supply increased on the 2000-2015 period, however there is need to accelerate progress.
- For instance, Turkey is already experiencing less rainfall and wastewater is considered an alternative resource for water supply. Pakistan has one of largest irrigation system in the world, yet the country also experiences a serious problem with water scarcity. Groundwater is major water source and the country lacks water storage.

**Photos**

Dr. Manzoor Qadir presents on unconventional water resources in dry areas for sustainable development

Panelists discuss how unconventional water resources contribute to achieving SDG 6 in different countries
Open discussion from panelists’ contributions and audience
Session title  
Capacity building of water reuse

Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Speaker/Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30 - 13:35(5’)</td>
<td>Welcome Address</td>
<td>Mr.Tea-Hyun Park, Executive Vice President, K-water</td>
</tr>
<tr>
<td>13:35 - 13:47(12’)</td>
<td>Integrated Water Resources Management(IWRM) &amp; water Reuse</td>
<td>Mr. Nidal Salim, Director, GIWEH(Global Institute for Water Environment and Health)</td>
</tr>
<tr>
<td>13:47 - 13:59(12’)</td>
<td>Activation of Water Reuse for the Utilization of Industrial Water</td>
<td>Mr. Kyung-Hyuk Lee, Doctor, K-water</td>
</tr>
<tr>
<td>13:59 - 14:11(12’)</td>
<td>Operation Status and Future Prospects of Rainwater Use &amp; Gray-water Reuse Facilities in Korea</td>
<td>Mr. Kyung-Kuk Min, Doctor, K-eco</td>
</tr>
<tr>
<td>14:11 - 14:23(12’)</td>
<td>Water Reclamation in sustaining Singapore water security in the climate change Era</td>
<td>Mr. How Yong Ng, professor, NUS Environmental Research Institute</td>
</tr>
<tr>
<td>14:23 - 14:35(12’)</td>
<td>Construction of Smart City by Using the Information on the waste water</td>
<td>Mr. Seong Pyo Kim, professor, Korea University</td>
</tr>
<tr>
<td>14:35 - 15:00(25’)</td>
<td>Panel discussion</td>
<td>Moderator(1), Speaker(5)</td>
</tr>
</tbody>
</table>

⇒ Moderator : Mr. Joon Hong Park, Professor, Yonsei University

Results

Presentations

- **Integrated Water Resources Management(IWRM) & water Reuse (Mr. Nidal Salim, GIWEH)**  
  sustainable Solution  
  1. Incentives: Get the price right. Incentives to save water and use it more efficiently.  
  2. Internalize externalities and get the policies right.  
  3. Innovation: improve water use efficiency, better irrigation technologies, minimize losses (70%) and leakage, R&D for adaptation to water stress.  
  4. Information: promote best practices, education, training, capacity building, international help.  
  5. Integration: there is no silver bullet. Integrate multiple approaches, technology and economic solutions.

- **Activation of Water Reuse for the Utilization of Industrial Water (Mr. Kyung-Hyuk Lee, K-water)**  
  Strategies to Increase Rate of Industrial Usage  
  - High Industrial Water Tariff & Industrial Water Demand  
  - High Quality Industrial Water Demand (UPW, Cooling Tower)  
  - Renewable Energy & Waste Resource Utilization  
  - Municipalities Incentives(MWW Tariff Exemption)  
  - Government Subsidies  
  - Susceptibility of Industrial Water Customers

- **Operation Status and Future Prospects of Rainwater Use & Gray-water Reuse Facilities in Korea (Mr. Kyung-Kuk Min, K-eco)**

- **Future Direction**  
  - Establishment of sustainable water circulation system through integration management by each watershed  
  - Diversification of water reuse according to demand characteristics  
  - Improvement of Public relations and education in Water reuse

- **Water Reclamation in sustaining Singapore water security in the climate change Era(Mr. How Yong Ng, NUS Environmental Research Institute)**  
  Energy efficiency for future water reuse

- **Construction of Smart City by Using the Information on the waste water(Mr. Seong Pyo Kim, Korea University)**
WBE may be able to provide more direct measures of population health, by measuring biomarkers of food, diet and health in SMART CITY.

These methods would depend greatly on future advances in fields such as “omics” (metabolomics) to inspire potential WBE biomarkers which can provide meaningful information on population health.

**Discussion**

- Results

**Water Reuse activation plan**

**Photos**

<table>
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<td>Panal discussion</td>
</tr>
</tbody>
</table>
Dr. Youssef Filali

IHP’s activities ensure the necessary human focuses on six thematic areas to assist Member States in their challenging endeavor to better manage and secure water and to improve knowledge and innovation to address water security challenges applying IWRM principles.

- Theme 1 (Water-related Disasters and Hydrological Change): Improving the scientific basis for hydrology and water sciences for preparation and response to extreme hydrological events. (e.g. Synthesis meeting of Glacier Retreat in the Andes project in Aug. 2017, Argentina)
- Theme 2 (Groundwater in a Changing Environment): Groundwater resources projects in Africa, water cooperation in transboundary waters
- Theme 3 (Addressing Water Scarcity and Quality): Improving governance, planning, management, allocation, and efficient use of water resources, dealing with present water scarcity and developing foresight to prevent undesirable trends (e.g. G-WADI Geoserver application in Namibia), 16 IIWQ Technical and Policy Case Studies on Emerging Pollutants
- Theme 4 (Water and Human Settlements of the Future): Joint research project with ME of ROK (Sustainable Water Security for Human Settlement in Developing Countries under Climate Change)
- Theme 5: Ecohydrology Web Platform

Program

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>13:30 - 13:35(5’)</td>
<td>OPENING</td>
<td>Dr. Kwang-suop Lim, Programme Manager of UNESCO i-WSSM</td>
</tr>
<tr>
<td>13:35 - 13:40(5’)</td>
<td>WELCOMING SPEECH</td>
<td>Dr. Yang Su Kim, Director of UNESCO i-WSSM</td>
</tr>
<tr>
<td>13:40 - 14:00(20’)</td>
<td>KEYNOTE SPEECH: Achieving Sustainable Development Goals from a Water Security Perspective</td>
<td>Dr. Youssef Filali-Meknassi, Director of Division of Water Sciences, UNESCO</td>
</tr>
<tr>
<td>14:00 - 14:10(10’)</td>
<td>OVERVIEW: Global Water Security Issues: Water Security and the Sustainable Development Goals</td>
<td>Ms. Bitna Lee, Programme Specialist of UNESCO i-WSSM</td>
</tr>
<tr>
<td>14:10 - 14:25(15’)</td>
<td>PRESENTATION 1: Strategies for Sustainable Water Security: Diversification, Decentralization, and Integration</td>
<td>Prof. Leehyung Kim, Professor of Kongju National University</td>
</tr>
<tr>
<td>14:25 - 14:40(15’)</td>
<td>PRESENTATION 2: Integrated Climate Action in the Context of Water-land Nexus: Centrifugal Force Vs. Centripetal Force</td>
<td>Dr. Hyun Jung Park, Vice Director of Institute for Climate Change Action</td>
</tr>
<tr>
<td>14:40 - 14:55(15’)</td>
<td>PRESENTATION 3: Exploration of the Water-Energy-Food Nexus for Policy Making and Implementation</td>
<td>Prof. Seungho Lee, Professor of Graduate School of International Studies, Korea University</td>
</tr>
<tr>
<td>14:55 - 15:25(35’)</td>
<td>PANEL DISCUSSION</td>
<td>Chair: Mr. Callum Clench, Executive Director of IWRA Panel: All speakers</td>
</tr>
</tbody>
</table>

Results

Presentations

- Achieving Sustainable Development Goals from a Water Security Perspective Title of presentation (Dr. Youssef Filali-Meknassi, Water Sciences, UNESCO)

- IHP is the only intergovernmental programme of the United Nations system devoted to water research, management, education and capacity building.

- IHP-VIII (2014-2021) ‘Improve knowledge and innovation to address water security challenges applying IWWRM principles’ focuses on six thematic areas to assist Member States in their challenging endeavor to better manage and secure water and to ensure the necessary human and institutional capacities.

- IHP’s activities are contributing to improve water security on each thematic area of eighth phase.

- Theme 1 (Water-related Disasters and Hydrological Change): Improving the scientific basis for hydrology and water sciences for preparation and response to extreme hydrological events. (e.g. Synthesis meeting of Glacier Retreat in the Andes project in Aug. 2017, Argentina)

- Theme 2 (Groundwater in a Changing Environment): Groundwater resources projects in Africa, water cooperation in transboundary waters

- Theme 3 (Addressing Water Scarcity and Quality): Improving governance, planning, management, allocation, and efficient use of water resources, dealing with present water scarcity and developing foresight to prevent undesirable trends (e.g. G-WADI Geoserver application in Namibia), 16 IIWQ Technical and Policy Case Studies on Emerging Pollutants

- Theme 4 (Water and Human Settlements of the Future): Joint research project with ME of ROK (Sustainable Water Security for Human Settlement in Developing Countries under Climate Change)

- Theme 5: Ecohydrology Web Platform
- Theme 6 (Water Education, Key to Water Security): Coordination and data management of all training activities for IHP and the Water Family (e.g. Hydro Open-source software Platform of Experts, FREE and open-source for WAT resources management, the Water Information Network System)

- Identified topics and issues for IHP-IX (in progress)
  - Topic 1: Addressing the gap between data and information in support of water resources management
  - Topic 2: Assessing uncertainty and supporting science-based decisions in a dynamic reality
  - Topic 3: Achieving sustainable water management (SWM)
  - Crosscutting issue 1: Water education in the fourth industrial revolution
  - Crosscutting issue 2: Water governance
  - Crosscutting issue 3: ICTs: Driving a new era of water resources management

  - In 21st century, we have faced several challenges to the water security.
  - IHP-VIII aims to improve knowledge and innovation to address water security challenges.
  - To play the important role to build the future we want, we need to harness the contributions of science and innovation for water security. Responding to this call for action, i-WSSM and UNESCO are giving efforts together.

- i-WSSM and UNESCO are annually co-publishing the Global Water Security Issues (GWSI) series with emerging water security-related issues.
  - It contains the most current information available concerning the state of knowledge on water security in the perspective of sustainable development.
  - The first GWSI series ‘Water Security and the Sustainable Development Goals’ covers wide range of water security issues related to the SDGs including the academic theories and international and regional case studies.
  - The second GWSI series will be published with the title of ‘Water Reuse within a Circular Economy Context’.

- The efforts to put science into action will make a sustainable and prosperous future for all.

- Strategies for Sustainable Water Security: Diversification, Decentralization, and Integration (Prof. Leehyun Kim, Kongju National University)
  - Diversification, decentralization, and integration are suggested as strategies for sustainable water security.
  - Water security problems in agricultural areas usually come from exceeding water use for irrigation from surface and groundwaters, surface water and groundwater contamination, and failure of water infrastructures.
  - Water security problems in urban areas occur due to distortion of natural water circulation from high imperviousness, reduction of groundwater level, heat islands effects, groundwater contamination, and increase of water demand.
  - NBS solutions such as low impact development and green infrastructure will improve water security.

- Water resources, water environment, water safety, and water ecology should be considered in terms of water security.

- Integrated Climate Action in the Context of Water-land Nexus: Centrifugal Force Vs. Centripetal Force (Dr. Hyun Jung Park, Institute for Climate Change Action)
  - Water security is a key to a sustainable future that addresses beyond the traditional water sector.
  - The nexus approach is needed to explore co-beneficial solutions.
  - Climate neutral world can be achieved by incorporating both mitigation and adaptation measures into the development pathway.
  - Efforts to fill the knowledge gaps, systematic data collection and assessment, institutional reform, enhanced coordination, and cross-sectoral collaboration are needed for integrated climate action.
  - A holistic assessment of climate action should be enhanced at the preparation, planning and evaluation stages.
  - A precautionary approach should be applied to reduce counter-productive consequences of climate action.
  - Integrated development plans should be developed in the water-land nexus and climate action should be mainstreamed.
  - Balanced approach to empower key actors in both water and land sectors is needed.

- Exploration of the Water-Energy-Food Nexus for Policy Making and Implementation (Prof. Seungho Lee, Graduate School of International Studies, Korea University)
  - The magnitude of the Water-Energy-Food Nexus
    - Promotion of resource use efficiency, resource conservation and efficient management of resources, a key to achieving sustainable development.
    - As it is at the early period, the stage of conceptualization, discussion on relevant policies, and institutional framework are needed.
  - The need for the nexus based policy framework
    - Silo-based policy-making & implementation led to inefficient use of resources, resource waste & detrimental impacts on the environment
    - Integrated policy, least trade-offs, maximum synergies
    - More investment in R&D on the water-energy-food nexus
    - Small-scale research needed to focus on pairing, (i.e. water-energy, energy-food, water-food and then research expanded to look at the nexus between water, energy, and food)
Discussion

○ Results
  - NBS is more efficient comparing to the existing solutions
    - Green infrastructure increases cost-effectiveness comparing to the gray infrastructure by lowering the maintenance cost.
    - LID decreases manual efforts through ecological function while the existing infrastructure should be manually managed for maintenance.
  - Current challenges of NEXUS
    - The tendency to communicate in the language of specialists limits the possibility of discussion with the diverse field. It is necessary to induce participation of non-water experts.
    - The local context should be dealt with to expand the discussion and experts from wide a range of fields that affect water, such as energy, food, and agriculture should be involved in the discussion.
    - A confrontation of water conservation and afforestation and reforestation may result water shortages and negatively affect local communities.
  - Considering gender equality and Africa priority
    - Gender equality and Africa priority are considered for all process of publications.
    - At the stage of the first submission of publication proposal, the gender context analysis should be undertaken as an integral part of the need a context assessment, and present clear sex-disaggregated data and statistics.
    - At the stage of the finalization of the manuscript, the ratio of women and men authors should be considered and should comply with the guideline on gender-inclusive language.
    - For the second edition of the GWSI series, more authors from African countries will be engaged and African context will be included.

○ Major messages
  - As the water challenges are impacting every region around the world, water security becomes the major global issue.
  - Confronted with the on-going water-related challenges, addressing water security can be a practical approach to deal with the complex and interconnected challenges and enhance sustainability, development and human welfare.

There are on-going efforts to enhance water security from international organizations such as UNESCO and i-WSSM, academia, institutions, etc. The collective actions will make a sustainable and prosperous future for all.

Photos

Welcoming Speech
(Dr. Yang-su Kim, Director of UNESCO i-WSSM)

Keynote Speech
(Dr. Youssef Filali-Meknassi, Director of Division of Water Sciences, UNESCO)
<table>
<thead>
<tr>
<th>Presentation</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Prof. Leehyung Kim, Professor of Kongju National University)</td>
<td>(Dr. Hyun Jung Park, Vice Director of Institute for Climate Change Action)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel Discussion</th>
<th>Participants of the TIP Platform session</th>
</tr>
</thead>
</table>
**Program**

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00-10:15 (15’)</td>
<td>Introduction of the speakers and opening of the event</td>
<td>Ms Glory Utunedi</td>
</tr>
<tr>
<td>10:15-10:45 (30’)</td>
<td>Global Support for Victims-Africa’s Rising Water Crisis and Mitigating Desertification</td>
<td>Dr. Tunji John Asaolu , Nigerian Representative, African Union Economic, Social and Cultural Council (AU-ECOSOCC)</td>
</tr>
<tr>
<td>10:45-11:00 (15’)</td>
<td>The Role of Community &amp; Civil Society in Water Management</td>
<td>Ms. Opeyemi Marcellina Aderinto, Executive Director, African Center for Human Advancement, Social and Community Development</td>
</tr>
<tr>
<td>11:00-11:15 (15’)</td>
<td>The Impact of Climate Change on Water Resources</td>
<td>Mr. Abdufatai Ogundana, Deputy Executive Director, African Youth International Development Foundation (AFYIDEF)</td>
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</tbody>
</table>

**Presentations**  
The Role of Community and Civil Society in Water Management (Ms. Opeyemi Marcellina Aderinto, African Centre for Human Advancement Social and Community Development ACHASCOD)

The Impact of Climate Change on Water Resources (Mr Fatai Damilola Ogundana, African Youth International Development Foundation AFYIDEF)

**Discussion**

- **Results**
  Excellent with a lot of input and recommendations as stated below in addition to our paper presentations

- **Major messages**
  We also examined the socio economic benefit of iceberg in South Africa. The discussants also talked on water desertification as capital intensive project, Water allocation (Cooperation). Cooperation like Lake Victoria trans-border organization, Zambezi in south Africa. We are to also adhere to the collective framework of African Union Agenda 2063 and the Nile River Basin initiative.

  South Africa is planning iceberg, there were tossing questions if it has Economic Benefit. In conclusion water reservoirs are owned by farmers –Agricultural and the domestic supply

- **Others**
  And further request the AU-ECOSOCC being an advisory organ of AU member states to issue advisory opinion to African Union Member States on water management in Africa as well as the outcome of KIWW2019.

  We also advice that next time they should have partnership with the Ministry of Foreign Affairs of South korea so as to make visa issue a mild thing and not tough in our case

  HOWEVER, IN CONCLUSION,

  The participant request the secretariat of KIWW to reconsider and approve AU-ECOSOCC and ACHASCOD to continue discussion with this session in the next World Water Congress come May 11-15, 2020 because it is an interesting topic which should come to an end in a day workshop.
Dr. Tarji John Aseoku delivering the keynote paper: Global Support for Victims: Africa’s Rising Water Crisis and Mitigating Desertification

View of all Participants

Ms. Opeyemi Marcellina Aderinto delivering her paper titled the role of community and Civil Society in Water Management

Group Photograph of all participants after the session

Group photography of participants from Nigeria

Ms. Opeyemi Marcellina Aderinto handling the questions and answer session
The concept of water safety is often reduced to the idea of quantity. However, a large section of the population still does not have access to water of sufficient quality not to affect their health. Alas, water quality is also affected by external pressures such as increasing demography, climate change or new types of pollutants. How to address this essential and often overlooked component of water security?

IWRA has a long experience working on water quality issues. This has been transcribed by both by the realization of thematic projects dedicated to the theme, and by a strong involvement in the thematic processes of the World Water Forum, as a Champion or Strategic Partner. This involvement persists in the preparation of the upcoming 9th Forum being organised in Dakar, in 2021.

This forum is being organized for the first time in Sub-Saharan Africa, in an area where practically half of the population remains in a precarious situation vis-à-vis access to water. What are the challenges, near the mid-point of the 2030 Agenda, to ensure decent water quality for the population, and what messages should be brought to Dakar in 2021?

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<table>
<thead>
<tr>
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</thead>
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<td>Welcoming remark</td>
<td>Patrick Lavarde, Chair of 9th World Water Forum</td>
</tr>
</tbody>
</table>
| 10:45 – 11:30 (45’)  | Panel Discussion – Of water quality challenges to achieve Water Security | - Prof. Dongil SEO, Chungnam National University  
- Gabriel Eckstein IWRA President  
- Fatima Bareerah, PCRWR (Pakistan Council of Research in Water Resources)  
- Marcus Wishart, World Bank |
| 11:30 – 11:50 (20’) | How to build strong messages to the Forum? Q&A with the audience         | Moderator: Gary Jones – ISC Chair of the XVII World Water Congress                                     |
| 11:50-12:00 (10’)   | Concluding Remarks                                                       | Moderator: Gary Jones – ISC Chair of the XVII World Water Congress                                    |

**Results**

**Presentations**

- **Intelligent Management System of Nonpoint Source Pollutant Loads in Urban Runoffs (Prof. Dongil SEO, Chungnam National University)**

ISTORMS (Integrated Stormwater Runoff Management System): The ISTORMS includes water quantity and quality prediction using a hydrological model, real time monitoring and sampling techniques, and automatic or remotely controllable in-situ runoff pollutant treatment system. Prof Seo addressed what needs to be done in order to connect information between basins and their water bodies by introducing ISTORMS’ case study.

- **Pharmaceuticals Pollution in our Freshwater Systems (Gabriel Eckstein, IWRA President, Texas A&M University)**

Prof. Eckstein discussed the extent of pharmaceuticals pollution in our freshwater systems, their sources, the threat that it poses to people and the environment, how we currently manage it, and what strategies might be used to reduce its presence in the environment. Prof. Eckstein concluded by highlighting the need to target early stages of pharmaceuticals lifecycle (improve the physiological absorption of drugs, reduce dosages, reduce use of substances that are known to be harmful to humans or the environment, education of doctors and nurses and development of alternative produces, and finally, improve Recycling, take-back, and other programs for proper disposal).

- **Knowing Water Quality is halfway to achieving water security (Fatima Bareerah, PCRWR)**
After presenting the key water quality challenges (pollution of surface water and ground water, sea water intrusion and soil salinity) as well the status of drinking water in Pakistan (microbial contamination, arsenic nitrate and fluoride contamination in some provinces), Mrs. Fatima presented a roadmap to achieve drinking water security in Pakistan: Setting realistic aspirations and fair reporting is a gate way to water security; Improve Federal government control through policies, laws and regulations; Strengthen capacity building of provincial government departments for implementation and development to improve service delivery; Impulse change in governance system (e.g. convert to bulk water supply phase-wise); Raise awareness that tap water is not a free commodity; Raise awareness through education at all levels, media and ownership by larger power centres and influencers.

- **Quality unknown, the invisible water crisis (Marcus Wishart, World Bank)**
  The world faces an invisible crisis of water quality. Its impacts are wider, deeper, and more uncertain than previously thought and require urgent attention. While much attention has focused on water quantity – too much water, in the case of floods; too little water, in the case of droughts – water quality has attracted significantly less consideration. Quality Unknown shows that urgent attention must be given to the hidden dangers that lie beneath the water’s surface:
  - Water quality challenges are not unique to developing countries but universal across rich and poor countries alike.
  - What we think of as safe may be far from it. Water quality is complex and its impacts on health and other sectors are still largely uncertain. Worse, regulations guiding safety standards are often fragmented across countries and agencies, thus adding to this uncertainty.
  - The forces driving these challenges are accelerating. Intensification of agriculture, land use changes, more variable rainfall patterns due to climate change and growing industrialization due to countries’ development all continue to grow.

Poor water quality threatens growth, harms public health and imperils food security: water pollution endangers economic growth. The release of pollution upstream acts as a headwind that lowers economic growth downstream. When Biological Oxygen Demand (BOD) – a measure of how much organic pollution is in water and a proxy measure of overall water quality – passes a certain threshold, GDP growth in downstream regions is lowered by a third. In middle-income countries – where BOD is a growing problem because of increased industrial activity - GDP growth downstream of highly polluted areas drops by half.

**Discussion**

- **Results**
  This very productive session brought together Korean and international water quality experts from international and national organisation, private and public sectors, as well as representatives of the 9th World Water Forum Process. The main objective of this session was to set clear priorities and messages to address the challenges of global water quality that can be integrated into the thematic framework of the 9th Forum: the main messages of the session can be found below.

- **Major messages**
  - There is a need to target early stages of pharmaceuticals lifecycle to avoid or reduce pharmaceuticals pollution: improve the physiological absorption of drugs, reduce dosages, reduce use of substances that are known to be harmful to humans or the environment, education of doctors and nurses and development of alternative produces, and finally, improve recycling, take-back, and other programs for proper disposal.
  - There is a strong need to include women in decision making.
  - Information is both a resource and a rallying cry. The first step to tackling the water quality challenge is recognizing the scale of it. The world needs reliable, accurate and comprehensive information so that new insights can be discovered, decision-making can be evidence-based and citizens can call for action. Encouraging and enabling this information and its sharing is critical to getting water pollution under control.
  - Prevention is better than cure. While sunlight may be the best disinfectant, legislation, implementation and enforcement are also crucial to scrub the world’s waterways of pollution. Information and transparency must be coupled with well-designed, effectively implemented and scrupulously enforced regulations for firms and individuals to adhere to water quality guidelines.
  - Invest in what works. Pollution that cannot be prevented must be treated. Wastewater treatment has a vital role to play – it is crucial for a country’s health, food security and economy by helping remove pollution and debris. Investments in wastewater treatment are a down payment on a cleaner future.

- **Others**
  A follow up session could be organized either a the XVII World Water Congress in Daegu, 11-15 May 2020, or in any other international milestone event on the road to the 9th World Water Forum. As Strategic Partner for the Thematic Priority of Water Security for the 9th World Water Forum, IWRA will make sure to report from the session and include those messages within the structure of the Water Security theme.
Photos

YoonJin Kim from KWF addressing how water security was considered across the Forum processes

Patrick Lavarde, Co Chair of the WWF9, addressing some welcoming remarks

Overview of the panel (from left to right: Marcus Wishart, World Bank, Dongil Seo, Chungnam University, Gabriel Eckstein, IWRA President, and Bareerah Fatima, PCRWR)
Session title: The Revolutionary Sustainable Finance Scheme to Tackle Water Crisis in Lombok, Indonesia

Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30 – 13:35 (5’)</td>
<td>Opening remark/Short Video on Lombok Payment for Water Services</td>
<td>MC – WWF Indonesia</td>
</tr>
</tbody>
</table>
| 13:35 – 14:05  | WWF Indonesia - Innovative approaches to restore watershed in Mount Rinjani involving communities. | Irwan Gunawan                                          
|               |                                                                          | Director of Forest and Water WWF Indonesia             |
| 14:05 – 14:35 | The roles of private sector or local NGO for water conservation          | Amanda Loeffen                                          
|               |                                                                          | Director General                                        
|               |                                                                          | Water Lex – Switzerland                                 |
| 14:35 – 14:55 | Q&A                                                                      |                                                        |

Results

Presentations

- Irwan Gunawan/ WWF Indonesia
  Population, scarcity of productive land, along with social and economic pressure, have forced people to encroach on the forests, including in Mount Rinjani, Lombok Island, East Nusa Tenggara Province - Indonesia. This threatens the integrity of ecosystems and their hydrological and ecological functions, severely reducing the quality and quantity of freshwater in Lombok. These trends suggest that the island may soon experience generalized water scarcity if action is not taken at the required scale.

  WWF Indonesia has the initiative to launch a revolutionary Payment for Watershed Services (PWS) project. This project started from preparation stage in 2002 that focused on maintaining water supply which covers the southern slope of Rinjani. It needed 3 years after the launching to engage with the key stakeholders. Finally in 2009, the local decree was issues and the total fund of USD 65,300 collected to restore 2,100 ha degraded lands by planting 660,000 trees and giving the financial benefit to local communities.

- Amanda Loeffen
  The roles of private sector or local NGO for water conservation

Discussion

- Discussion point:
  1. Relevance of Mount Rinjani for Payment for Environment Services (PES) – based restoration
  2. Economic Valuation of Rinjani Ecosystem
  3. Payment from Water Use for Restoration Program
  4. Promote collaborative management of river basin/watershed catchment areas

- Major messages:
  1. Advocating a “pro poor” policy framework to sustain the collaborative and multi-stakeholder.
  2. Strengthening and provide local capacity building of multi stakeholder forum
  3. Share lessons – learned among the sites and provincial level.
Photos

<table>
<thead>
<tr>
<th>Mr. Irwan Gunawan/Director of Forest and Fresh Water</th>
<th>Ms. Amanda Loeffen/General Director Water Lex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>Presentation by WWF Indonesia</td>
</tr>
</tbody>
</table>
Date/Time/Venue: September 5 (THU) / 09:00-16:00/#322B (3F), EXCO

(Co-)Organizer: Korea Environment Corporation(K-eco), United Nations Office for Sustainable Development(UNOSD), United Nations University Institute for Water, Environment and Health(UNU-INWEH), Ministry of Environment, Rep. of Korea(MOE)

Session title: Using SDG 6 Policy Support System (SDG-PSS) to facilitate Countries in the Asia region for water-related sustainable development

Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Participants</th>
</tr>
</thead>
</table>
| 09:00 - 09:30(30’) | Opening Session                              | Moderator: Ms. Eunhae Jeong, Senior development management expert of UNOSD  
-Mr. Jeongseop Hong, Director General of MOE  
-Mr. Ickhoon Choi, Executive Director of K-eco  
-Mr. Jongsoo Yoon, Former Head of Office of UNOSD  
-Mr. Vladimir Smakhtin, Director of UNU-INWEH |
| 09:30 - 10:00(30’) | Session I: Global efforts in monitoring and progress towards achieving SDG 6 | Moderator: Mr. Manzoor Qadir, Assistant Director of UNU-INWEH  
-Mr. William Reidhead, Global Monitoring Officer of UN-Water |
| 10:00 - 11:00(60’) | Session II: Using SDG-PSS to support evidence-based policymaking around SDG 6 | Moderator: Mr. Manzoor Qadir, Assistant Director of UNU-INWEH  
-Mr. Guillaum Baggio, Research Associate of UNU-INWEH  
-Ms. Eunhae Jeong, Senior development management expert of UNOSD |
| 11:00 - 12:00(60’) | Session III: Status of SDG 6 and use of SDG-PSS in regional hub countries | Moderator: Mr. Guillaum Baggio, Research Associate of UNU-INWEH  
(Republic of Korea)  
-Nationalizing The 2030 Global Goals: Korea’s National Sustainable Development Goals (K-SDGs), Mr. Hakkyun Maeng, Director of MOE  
-Case Study on the application of SDG-PSS in Korea, Mr. Yongjae Choi, Assistant manager of K-eco  
(Pakistan)  
-Mr. Muhammad Ashraf, Director of Pakistan Council of Research in Water Resources (PCRWR)  
-Ms. Bareerah Fatima, Assistant Director of PCRWR |
| 13:00 - 14:30(90’) | Session IV: Feedback on SDG-PSS from participating countries for the region | Moderator: Mr. Jongsoo Yoon, Former Head of Office of UNOSD  
- Participation countries: Armenia, Bangladesh, Cambodia, Iran, Mongolian, Sri Lanka, Tajikistan, Turkey, Vietnam |
| 14:00 - 15:00(60’) | Session V: Building regional cooperation around SDG 6 and SDG-PSS | Moderator: Mr. Manzoor Qadir, Assistant Director of UNU-INWEH |
| 15:30 - 16:00(30’) | Wrap-up and closing session                   | Moderator: Mr. Guillaum Baggio, Research Associate of UNU-INWEH  
-Mr. Hakkyun Maeng, Director of MOE  
-Mr. Ickhoon Choi, Executive Director of K-eco  
-Ms. Eunhae Jeong, Senior development management expert of UNOSD  
-Mr. Vladimir Smakhtin, Director of UNU-INWEH |

Results

Presentations

- Session I: Integrated Monitoring of SDG 6 (Mr. William Reidhead, UN-Water)
  - Reliable and credible data on water and sanitation can play a key role in informing decision-making and promoting political commitment at all levels.
  - For this reason, the UN-Water Integrated Monitoring Initiative (IMI) for SDG 6 aims to support countries in
monitoring water- and sanitation-related issues within the framework of the 2030 Agenda.

- The main goal of the UN-Water IMI is to accelerate the achievement of SDG 6 by:
  1. supporting evidence-based policies, regulations, planning and investments;
  2. increasing the availability of country data to report on global progress towards SDG 6 and to inform water and sanitation policy making;
  3. developing methodologies and tools to monitor SDG 6 global indicators;
  4. raising awareness at the national and global levels about SDG 6 monitoring;
  5. contributing to technical and institutional capacity for monitoring.

- One of the key products of the UN-Water IMI is the SDG 6 Data Portal, which gathers data on all SDG 6 global indicators, as well as other key social, economic and environmental data, to allow for comparison among countries and over time, and to track progress at the regional and global levels.

- The SDG 6 Data Portal offers tailored options for visualization and analysis featuring maps, tables and charts, and allows users to:
  1. track overall progress towards SDG 6 at global, regional and national levels;
  2. produce an integrated assessment and analysis of the state of water resources, including linkages to other sectors;
  3. encourage and improve SDG 6 monitoring and reporting;
  4. raise awareness on the importance of water and sanitation.

- **Session II: SDG 6 Policy Support System (Ms. Eunhae Jeong, UNOSD & Mr. Guillaume Baggio, UNU-INWEH)**

  - The SDG-PSS is a user-friendly free system currently available online in English and French. The tool is an answer to the challenge of bringing data and information from multiple international and national tools and translating them into a ‘fit-for-policy’ evidence framework. These components stem from more than 20 well-established tools, processes and practices already being used by many countries for water-related management.

  - The tool is organized around six critical components:
    1. Capacity Assessment;
    2. Finance Assessment;
    3. Policy and Institutional Assessment;
    4. Gender Mainstreaming;
    5. Disaster Risk Reduction (DRR) and Resilience Mainstreaming;
    6. Integrity.

  - As policymakers, experts and development practitioners enter data and information required for each component of the SDG-PSS, the main outcome of the system is a summary view at the indicator level.

  - The summary view consists of an evidence framework on the enabling environment for SDG 6, and shows strengths and weaknesses, missing data, and gaps and opportunities across the system’s components and for all targets and indicators of SDG 6.

  - Policymakers, experts and development practitioners can then use this evidence framework for multisectoral collaborative planning to develop and implement water-related policies for strengthening the enabling environment for SDG 6 while getting people from different sectors, agencies and institutions to work together towards SDG success.

- **Session III: Status of SDG 6 and use of SDG-PSS in regional hub countries (Republic of Korea & Pakistan)**

**Republic of Korea (Mr. Hakkyun Maeng, MOE & Mr. Yongjae Choi, K-eco)**

- Republic of Korea has been playing a critical role in the development of the SDG-PSS. During the first phase of the project, the regional hub country hosted two national workshops promoting discussions on the generation of data required by the tool, leading thus the contextualization of the tool to fit on the country’s needs.

- National coordination has been a key success factor to create a common shared knowledge of concepts used in the tool. The country also highlighted that third-party verification of data entered in the tool was critical to ensure quality and was done by national statistics authorities.

- Currently, the country has almost all the indicators informed in the SDG-PSS. The challenge remains for the components ‘Gender’ and ‘Disaster Risk Reduction and Resilience’, which are estimated to be difficult to evaluate.

- A key learning from work done by Republic of Korea on the implementation and use of the SDG-PSS is to conduct the necessary analysis on already existing policies and programmers and adapt them to the requirements of tool.

**Pakistan (Mr. Muhammad Ashraf & Mr. Bareerah Fatima, PCRWR)**

- Pakistan was the first country to adopt the 2030 Sustainable Development Agenda in a unanimous parliamentary resolution passed in February 2016. The country’s key development goals are also closely aligned with the SDGs. They are seven pillars specified in the country’s long-term development roadmap ‘Vision 2025’.

- Status and Challenges of SDG 6 in the country:
  1. Legislative role of provinces in services delivery for SDG 6 and therefore reporting
A diversity of challenges/state of water resources among the provinces
Lack of coordination between SDGs in federal government with those of provincial government
Awareness regarding SDGs is low among the key reporting departments
Stern efforts are needed to get logical aspirations

- Potential of SDG-PSS for Pakistan:
  1. SDG-PSS allows to set realistic aspirations for SDG 6 achievement by 2030. The tool also encouraged a discussion around SDG 6 reporting at the national level.
  2. The tool helps prepare reports on SDG 6 for various forums, such as Federation, SDG's reporting unit, UNDP and provides comprehensive planning features to help consider new dimensions in policy making, such as integrity, and DRR.

Discussion – Session IV & Session V

- Results – Session IV: Feedback on SDG-PSS from participating countries from the region
  - This session provided the opportunity for participants from Armenia, Bangladesh, Cambodia, Iran, Mongolia, Sri Lanka, Tajikistan, Turkey and Viet Nam to share their feedback on how the SDG-PSS can be improved to better fit their needs. Participants had the opportunity to test the tool for one month prior to the workshop. Each country had five minutes to brief the audience, answering the following questions:
    1. What are your experiences with regards to the SDG-PSS?
    2. What are the challenges you have faced?
    3. What are the supports/capacities you need to foster its usage?
    4. What type of regional cooperation for the SDG-PSS is needed?
  - All participants recognized and praised the development of the tool, its role in providing the platform to work together, and monitor the progress of the enabling environment for achieving SDG 6.

- Results – Session V: Building regional cooperation around SDG 6 and SDG-PSS
  - Building regional cooperation might be key for success in promoting SDG-PSS as a tool for strengthening the enabling environments of SDG 6 in the Asia region. Countries that are now engaging in the implementation and use of SDG-PSS can rely on two regional hub countries – Republic of Korea and Pakistan – for support and knowledge exchange. This exchange between countries is a two-way learning experience, as feedback from users contributes to improving and enhancing the SDG-PSS. Providing official support to legitimate the use and institutionalize the SDG-PSS in these countries is, therefore, an important step during the current of the project.
  - During the workshop, participants highlighted:
    1. The importance of nominating a focal point not only for national implementation of the tool but also for building and strengthening regional cooperation.
    2. The need for regular follow-up to share challenges and practices beyond the scope of the regional workshop.

- Major messages
  - Making the right policy decisions in the SDG era can be quite complex, requiring policymakers and development practitioners to assess and combine many pieces of evidence from different agencies and sectors.
  - Deciding on exactly which piece of evidence is “fit-for-policy” to inform a specific policy process can be contentious, especially as there may be different or context-specific situations, or conflicting evidence.
  - In this way, the SDG-PSS provides a strong foundation for countries to advocate for a rational, rigorous and systematic approach to inform their policy processes and support decisions to achieve SDG 6 by 2030.
Mr. Hakkyun Maeng presents on status of SDG 6 in Korea

Mr. Yongjae Choi presents on the experience of implementing and using the SDG-PSS in Korea

Mr. Muhammad Ashraf and Ms. Bareerah Fatima present on the experience of implementing and using the SDG-PSS in Pakistan.

Mr. William Reidhead share his experience on integrated monitoring of SDG 6

Audiences

Audiences
Ms. Jongsoo Yoon moderates the session on feedback on SDG-PSS from participating countries (Cambodia)

Ms. Cigdem Kus (Turkey) gives her feedback on SDG-PSS

Mr. Manzoor Qadir moderates the session on building regional cooperation around SDG 6 and SDG-PSS

Mr. Vladimir Smakthin wrap up the workshop highlighting key exchanges between participants
**Date/Time/Venue**  
September 5 (Thu) / 17:00-18:30/#322 (3F), EXCO

**Organizer**  
Jinsuhk Suh/Eunhwa Choi

**Session title**  
Global Implications and Lessons for Good Water Governance Systems at the River Basin Level in Korea

### Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Participants</th>
</tr>
</thead>
</table>
| 17:00 - 17:05(5’) | Welcome Address                                                           | Mr. Gi-Sung Hwang  
(K-water Research Institute) |
| 17:05 - 17:20(15’) | Water Conflicts in the Mekong River Basin and the Role of Institutions for Conflict Resolution | Ms. Eunhwa Choi  
(K-water Research Institute) |
| 17:20 - 17:35(15’) | Multi-stakeholder Partnership for Sustainable Use of Water in Sri Lanka – Futuristic Views | Mr. Ranga Pallawala  
(Janathakshan) |
| 17:35 - 17:50(15’) | Best Management Practices in South East Asia to secure Water Governance | Dr. Sang-Young Park  
(ADB, Indonesia) |
| 17:50 - 18:05(15’) | Water Governance Change of Korea                                           | Prof. Chang-Soo Kim  
(Pukyoung National University) |
| 18:05 - 18:25(20’) | Panel Discussion and Q&A                                                  | 1 Moderator and 4 Panelists |
| 18:25 - 18:30(5’) | Wrap-up                                                                   | Moderator |

### Results

**Presentations**

- **Water Conflicts in the Mekong River Basin and the Role of Institutions for Conflict Resolution (Ms. Eunhwa Choi, K-water Research Institute)**  
This presentation introduced the elements of the conflict resolution related to transboundary river and adaption in the Korea water conflict. Ms. Eunhwa Choi highlighted three elements; Building Institutional Capacity, Understanding the Conflict & Priority for Resolutions, and Binding Force. In order to achieve these three, firstly all stakeholders should be included in institutions and decision-making processes, common interests should be identified and pursued together, and lastly, an appropriate funder that can provide sustainable funding to carry out the relevant projects. These factors can be applied in Korea’s water conflict and its resolution. Currently, Korea established the National Water Management Committee and the Basin Water Management Committee. In light of the Mekong River case, she suggested that these institutions in Korea need to consider three principles, all stakeholder’s participation in the committees, identification of common interests in the river basin, and securing an appropriate funder.

- **Multi-stakeholder Partnership for Sustainable Use of Water in Sri Lanka – Futuristic Views (Mr. Ranga Pallawala, Janathakshan)**  
Water management and partnership in Sri Lanka were introduced by Mr. Ranga Pallowala, CEO of Janathakshan. Janathakshan is an environmental Non-government Organization in Sri Lanka which has carried out diverse projects related to the environment. Sri Lanka has rich water resources but there are spatial and temporal variations of water availability. The majority of people highly depend on agriculture which is water intensive. So, a pertinent development plan is necessary. Currently, the cost of non-collaboration in Sri Lanka is increasing and the sense of water ownership also continues to increase. Thus, he highlighted the need for multi-layer cooperation from central to local and common information platforms for gathering and sharing information and quick analysis and smart decision-making.

- **Best Management Practices in South East Asia to Secure Water Governance (Dr. Sang-Young Park, ADB)**  
Dr. Sang-Young Park presented on intensive consultation for flood risk management with local stakeholders during project preparation to ensure that the project addresses the full range of problems and issues. He stressed that the government should routinely collect and analyze flood damage data. Support is needed for designing, developing sustainable long term flood management concepts and watershed management programs should be implemented to enhance the impact and sustainability of flood control works.
Water Governance Change of Korea (Prof. Chang-Soo Kim, Pukyoung National University)

Korea’s water governance has progressed over time. Recently, Korea showed a dynamic transformation on the water governance structure. Government departments related to water governance were over-fragmented on a multi-level before 2018. However, the departments were partially unified after 2018. He saw that this is the pathway to bridge seven gaps, which OECD mentioned, administrative, information, policy, capacity, funding, objective, and accountability gap. He highlighted three to create a better path for water governance in Korea. First, Basic Water Laws and a good steering committee would work well for the integrated water system in order to bridge the seven water governance gaps. Second, a cooperative government and civil society need to jointly participate in the decision-making stage rather than the implementation stage. Third, comprehensive participation between stakeholders including NGOs could enhance the socio-institutional capacity of coordination.

Discussion

Results

The overall discussion was about water governance in light of the features of each country. Ms. Choi, Mr. Ranga, Dr. Park, and Prof. Choi described the cases of the Mekong River basin, Sri Lanka, Indonesia, and Korea respectively. In terms of the Mekong River, a major feature is the transboundary river basin so that it needs to coordinate each benefit. Thus, six countries agreed to establish an institution to adjust potential conflicts and the institution which is called Greater Mekong Subregion plays a critical role in economic development as well as water governance in the region. Sri Lanka has tried to build a policy-making process which multi-layer governments are able to participate in. However, a concrete structure for the policy-making process with all stakeholders has yet to be settled in Sri Lanka. Indonesia is characterized by decentralization and religion based governance. Geographically, Indonesia is composed of thousands of islands, so the administrative power has been dispersed. This environment creates decentralized water governance. In addition, Islam highly influences governance so much that females have been excluded in decision-making processes. Lastly, Korea has just started with Integrated Water Resource Management based on Korea’s Basic Laws since last year. When seeing the laws, it shows the tendency of a decentralized water governance system through the Basin Water Management Council. This tendency is expected to give more opportunities for comprehensive participation for water governance.

Major messages

Successful water governance should include all stakeholders from the central government to civil society. Domestically, public and private participation is very important and in terms of the public sector, multi-level governments should be included in decision-making process. Internationally, institutions that coordinate interests among countries plays a significant role in good governance. Each presenter displayed different examples in different regions. However, the core message is that countries need to build institutional capacity to discuss different interests and to foster cooperation.

Photos

Gi-Sung Hwang, General Director of K-water Research Institute is opening the session with his welcome remarks. Ms. Eunhwa Choi, Researcher in K-water Research Institute is giving a presentation regarding water conflict resolution and institution.
Mr. Langa Pallawala, CEO Janathakshan, introduces multi-stakeholder partnership for sustainable use of water in Sri Lanka.

Dr. Sangyoung Park, a specialist in ADB, is displaying Best Management Practices in South East Asia to secure Water Governance.

Prof. Changsoo Kim is demonstrating the structural division of water management in Korea government.

Panel discussion is underway under Prof. Changsoo Kim’s facilitating.
**Date/Time/Venue**  
September 6 (Fri.) / 09:00-10:30/#321 B (3F), EXCO  

**Korea Water Forum**

**Co-Organizer**  

**Session title**  
Regional Collective Action on “Cooperation” towards the 9th World Water Forum

**Program**

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Speaker/Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 – 09:05</td>
<td><strong>Opening</strong></td>
<td>Dr. Jung-moo Lee, President (Korea Water Forum)</td>
</tr>
<tr>
<td>09:05-09:10</td>
<td>Water Cooperation in the Process of the 9th World Water Forum</td>
<td>Mr. Fawzi Bedredine, OMVS</td>
</tr>
<tr>
<td>09:10-09:25</td>
<td>Water Cooperation and Policy Impact in Asia : Case on the Mekong River</td>
<td>Prof. Seungho Lee, Korea University</td>
</tr>
<tr>
<td>09:25-09:40</td>
<td>Concerted efforts for Water Cooperation in Asia : Benefits and Hurdles</td>
<td>Mr. Fany Wedahuditama, Regional Coordinator of GWP Southeast Asia</td>
</tr>
<tr>
<td>09:40-09:55</td>
<td>Good Governance and Capacity Building for Water Cooperation in Asia Pacific Region</td>
<td>Dr. Shahbaz Khan, Director, Asia Pacific Regional Bureau for Science in Asia and the Pacific, UNESCO</td>
</tr>
</tbody>
</table>
| 09:55-10:25   | **Discussion**: What is water cooperation and what has to be done for sustainable cooperation Interaction with remote-participants (using on-line tool) | Mr. Eric Tardieu, INBO (Moderator)  
Prof. Seunghyun Kim, Kyungnam University  
Dr. Fawzi Bedredine, OMVS  
Prof. Seungho Lee, Korea University  
Mr. Fany Wedahuditama, Regional Coordinator of GWP Southeast Asia  
Dr. Shahbaz Khan, Director, Asia Pacific Regional Bureau for Science in Asia and the Pacific, UNESCO |
| 10:25-10:30   | **Encouragement and Closing**                                            |                                                                                      |

**Results**

**Discussion**

- Major messages
  
"Water cooperation" refers to the peaceful management and use of freshwater resources at local, national, regional, and international levels among various players and sectors. The concept of water cooperation entails working together towards a common goal, in a way that is mutually beneficial. Promoting water cooperation is a long-term and resource-intensive process. Partnerships and funds need to be mobilized for long-term processes, such as establishing collaborative structures and institutions, building capacity, trust, and consensus.

The concerted efforts must be made to promote water cooperation at river basin and local scales, including trans-boundary river basins, irrigation districts, and cities. Cooperation is necessary to deal with major issues such as water allocation decisions, upstream and downstream impacts of water pollution and water abstraction, construction and management of new infrastructures, dealing with illegal abstractions and overexploitation of surface and groundwater, deciding on the financing of water management, and improving water-related disaster management. The role of negotiation, mediation, and other dispute resolution mechanisms are key to improving cooperation processes.

Considering different stakeholders’ engagement and multi-level perspective for water cooperation, the purpose of the priority "Cooperation" in the process of the 9th World Water Forum is to seek a better understanding and measure the impacts of interactions between different actors, either with different interests or with common objectives. In addition to conflict prevention, the theme includes the promotion of positive cooperation. It should also confirm the potential of past cooperative work to address various local and global water-related challenges. It is indeed also important in the priority of "cooperation" to consider the significance of inter-sectoral and inter-actors impact as essential factors in promoting cooperation, as it has been demonstrated in the past cooperative actions for sustainable development or the achievement of SDGs.

In addition to sectoral cooperation, it is widely recognized that all actions undertaken, combining technical or technological solutions with political decisions, are the best solutions to water-related problems. Thus, providing potential for cooperation
through platforms to discuss or exchange on both technologies and policies is one of the most important ways to make implementation more sustainable.

To this end, understanding that cooperation is not merely the opposite of conflict, but the beginning of the development of effective policy, meaningful collaboration to achieve equitable outcomes is important. It also requires an interdisciplinary approach, combining bio-physical and geo-political aspects with engineering and decision-making as well as other relevant disciplines. It also requires working at different scales, with local, regional, or international actors. Finally, the process of promoting “cooperation” will be expected to have meaningful and influential outcomes to deliver both to water and non-water actors.
Date/Time/Venue  September 5 (Thu) / 13:30-15:30/#322 A (3F), EXCO

(Co-)Organizer   UNESCO International Centre for Water Security and Sustainable Management(i-WSSM)

Session title  Revising Water ODA in the view of Sustainability

Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30 - 13:35(5')</td>
<td>Opening Remark</td>
<td>Dr. Kim, Yangsu, Director of UNESCO i-WSSM</td>
</tr>
<tr>
<td>13:55 - 14:10(15')</td>
<td>(Cooperation) Public-Private Cooperation for Water and Climate Change</td>
<td>Dr. Kim, Yong Bin, Managing Director of Development Marketing Institute</td>
</tr>
<tr>
<td>14:10 - 14:25(15')</td>
<td>(Technology) Water ODA and Innovative Approaches for Global Sustainable Development</td>
<td>Dr. Lee, Woo Sung, CEO of STI Institute</td>
</tr>
<tr>
<td>14:25 - 14:40(15')</td>
<td>(Finance) Climate Finance and ODA in Water Sector</td>
<td>Dr. Kim, Ja Kyum, Vice-Chairman of Yooshin Engineering Corporation</td>
</tr>
<tr>
<td>14:40 - 14:55(15')</td>
<td>(Case 1) Climate Change Adaptation Project in Mekong Delta</td>
<td>Dr. Nam, Jonghyo, Urban Development Research Officer of UN Habitat Office in Vietnam</td>
</tr>
<tr>
<td>15:10 – 15:30(20')</td>
<td>Comprehensive Discussion</td>
<td>Moderator: Kwon, Tae Myon, Director of Incheon International Development Cooperation Center</td>
</tr>
</tbody>
</table>

Participants: Speakers

Results

Presentations

- **World Bank Group Water Sector Global Partnership (Dr. Hoon Sahib Soh, World Bank Group Korea Office)**
  The presentation consists of four thematic parts including an overview of World Bank Water Sector Engagement; World Bank and Korea Water Sector Partnership; Innovation and Technology for the Water Sector; and The WBG Korea Office introduction. The key points to achieve sustainability are 1. Diversification of finances focusing on MFD(Mobilizing Private Financing), 2. Better Technology, Better governance, Policy, and Regulation, etc.

- **Public-private Cooperation for Water and Climate Change (Dr. Kim, Yong Bin, Development Marketing Institute)**
  The presentation features Investment Climate in Water Sector under PPP Scheme and ODA, and ODA-applied PPP models. The essential element of a successful PPP project is that mitigating the gap between ‘expected return on investment’ and ‘actual return on investment’. Especially, the inaccurate responsibilities of donor and recipient countries are the most important factor.

- **Water ODA and Innovative Approaches for Global Sustainable Development (Dr. Lee, Woo Sung, STI Institute)**
  The presentation describes water Technologies and ODA relationship, Climate Change, and CDM for Water Technology, and actual implications of water technology. The speech emphasized on the importance of the great effort to adopt cutting edge technologies for developing countries with synthetic cooperation and coordination between public, private sector, and R&D industries.

- **Climate Finance and ODA in Water Sector (Dr. Kim, Ja Kyum, Yooshin Engineering Cooperation)**
  The presentation features Water ODA and Climate Finance in view of the industrial sector. To respond to the changes in engineering consulting services demands in the water infrastructure sector, it is most important to revise acknowledgment on climate change finances with active investment for developing countries.

- **Climate Change Adaptation Project in Mekong Delta (Dr. Nam Jong Hyo, UN-HABITAT Viet Nam Office)**
  The presentation consists of the introduction of UN-HABITAT Climate Change Adaptation Projects, especially the case study in the Mekong Delta region. To response to climate change and local demand, it is crucial that the local community’s capacity building and resilience of ecosystem-based on consistent infrastructure management.
Proposed GCF Strategy for the Water Sector, 2020-2023 (Ms. Chibesa Pensulo, Green Climate Fund)
The presentation introduces GCF strategies to promote a paradigm shift towards low-emission, climate-resilient sustainable development in the Water Sector.

Discussion
Results
The comprehensive discussion aimed to consult with participants on the scope for water ODA to address water security issues at global, regional, and national levels. Hence, the Concluding session summarized some of the main recommendations, actions and insights from the previous speeches, and review 'Water ODA' with objectives of Public-Private Cooperation, Finance, and Technology. The session facilitated interactions across issues, themes, and processes of the Water ODA and Sustainability, including the case study of Climate Change Adaptation Projects. The outcome was a greater understanding of shared objectives and actions that were possible to pursue within a Water sector for better Water ODA and improving the systematic efforts for Water Security and SDGs.

Major messages
Key messages from the water ODA issues were brought together in a synthesis session, where highlights including the case study were presented and discussed. A panel moderated by Mr. Kwon discussed how water ODA and Technology, Finance, and Cooperation need to be considered holistically, and the synthetic approach could be a leverage point for improving efficiency and long-term sustainability.

Photos
Welcome Remarks (Dr. Kim, Yang Su)  Keynote Speech(Dr. Hoon Sahib Soh)
Speech (Dr. Lee, Woo Sung)  Speech (Dr. Kim, Ja Kyum)
Speech (Dr. Nam, Jong Hyo)  Panel Discussion (Moderated by Mr. Kwon, Tae Myon)