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EDITORIAL

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We have great pleasure in introducing to you this special issue of *Irrigation and Drainage* with selected and reviewed papers prepared by authors from Asia from the 22nd International Congress of the International Commission on Irrigation and Drainage (ICID). The Congress was held in September 2014, Gwangju, Republic of Korea under the Theme: *Securing water for food and rural communities under climate change*.

In this issue you will find 12 selected papers that were originally submitted to the Congress Questions, the Special Session and the Symposium that were held during the congress.

In each ICID Congress there are two Questions under which papers can be submitted. Out of the papers of Question 58 on the theme *How irrigation and drainage play an important role in climate change adaptation?* four papers were selected for this Special Issue. The paper by

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Gurbachan Singh on *Climate change and food security in India: challenges and opportunities* describes the situation in India with respect to achieving food and nutritional security in a scenario of degrading natural resources. Climate change seems a big challenge for this large country where about one-sixth of the World population lives.

The other three papers under this question deal with aspects at river basin level. These are: i) So Ra Ahn and Seong Joon Kim on *Assessment of climate change impacts on the future hydrologic cycle of the Han River Basin in South Korea using a grid-based distributed model*. The purpose of their study is to assess the impacts of climate change on the hydrologic cycle of the Han River Basin in South Korea by using the Projection of Hydrology via Grid-based Assessment for Climate Change (PGA-CC) model; ii) Takao Masumoto *et al.* on *Basin-scale irrigation planning in areas with scarce data*. This paper is based on the past development of cascade irrigation facilities in Cambodia's Kep Province and presents the results of applying a distributed water-circulation model that incorporates agricultural water use in Cambodia's Pursat River Basin; iii) Takeo Yoshida *et al.* on *River basin scale analysis on return ratio of diverted water from irrigated paddy areas*. They state that water flows in irrigated paddy areas are complex not only because of substantial volumes involved, but also by repeated cycles of diversion and return flows. A spatially explicit hydrological model that simulates water diversion and return flow processes in irrigated paddy areas was used to evaluate the return ratio of diverted water to the river basin.

Five papers were selected for this Special issue out of the papers submitted for Question 59 on the theme *How do irrigation and drainage interventions secure food production and livelihood for rural community*. Two of these papers describe the situation at country level for

the Republic of Korea. The paper by Sang Bong Im *et al.* presents the *Contribution of agricultural infrastructure to rural development in the Republic of Korea*, while Sang-Hyun Lee *et al.* present an *Evaluation of the dependency and intensity of virtual water trade in Korea*. The aim of the first study is to analyze the effects of large-scale agricultural infrastructure investment on the rural development. The Yeongsan River Basin Comprehensive Development Project was selected as the case project and evaluated based on its individual impacts on agricultural and regional development. The authors of the second paper state that crop trade can be regarded as the primary source of water demand in terms of virtual water trade, and that the main importers would have to consider crop trade from a water management perspective. The aim of this paper is to evaluate the dependency and intensity of the virtual water trade in the Republic of Korea.

The three other papers deal with problems at scheme, or at on-farm level. These are: i) Hae Do Kim *et al.* who present a model study on *Irrigation canal network flow analysis by a hydraulic model*. They developed a hydraulic analysis model for irrigation canal flow by using the Storm Water Management Model (SWMM) module by combining a network model with a paddy water balance model. This model was applied to a rice paddy field rehabilitation project area in the Daesan District; ii) Dong-Ho Choi *et al.* who analysed *Farmer's water management practice and effective rainfall and runoff ratio of paddy fields*. Effective rainfall, which is used in paddy fields under farmers' current water management practices, was monitored during 2008 – 2012 in two paddy fields in Southern Korea. The study confirms that farmers have little incentive to use rainfall effectively for rice paddy culture because they can use irrigation water at no charge; iii) Yella Reddy Kaluvai who presents that *Micro irrigation in participatory mode*

pays huge dividends - APMIP experiences, India. The author states that in India more than 80% of the renewable water resources are consumed in agriculture and that the Government identified a suitable potential area of 69 million hectares for micro irrigation as a way of improving water and land productivity. In order to make the systems costs affordable to farmers, the government extends subsidy on the equipment cost. The State of Andhra Pradesh, India has launched the Andhra Pradesh Micro Irrigation Project (APMIP) in 2003 to promote this water saving irrigation technology at large-scale. The paper describes the experiences with the project so far.

In each ICID Congress there is also a Special Session. This time the Theme was *New partnership for rural development*. Only the paper by Victor A. Dukhovny *et al.* on *The role of donors in addressing water problems in Central Asia* was selected for this Special Issue. The authors examine the role of donors in addressing a complex set of water related challenges in Central Asia and draw some lessons with a view to improving efficiency and effectiveness of development assistance in the region.

The regular ICID Congress programmes are completed with a Symposium. This time the Theme was *Nonpoint source pollution and best management practices*. Two papers have been selected for this Special Issue, one deals with the experiences related to nonpoint source pollution control in the European Union and the other one with a similar topic in the Republic of Korea. The European paper on *Situation, strategies and best management practices to control agricultural nonpoint source pollution in the European Union*. was authored by Giorgio Provolo *et al.* The authors state that although significant improvements in water quality have been achieved in Europe over the last two decades, the water quality status is still below

desirable levels in many locations. Non-point source pollution from agricultural landscapes remains the key cause of water quality problems in many parts of Europe due to excess nitrogen, and in some countries, losses of phosphorus. A variety of physical, managerial, financial and political tools exist for addressing nonpoint source pollution from agricultural sources. However, water resource managers face difficulties in cajoling landowners to adopt the necessary actions, particularly if such actions do not enhance productivity, or the benefits are not apparent.

The Korean paper has been prepared by Moonsoo Cho *et al.* and describes the *Development of agricultural nonpoint source pollution reduction measures in Korea*. The authors state that the dramatic increase in non-point source pollutant loads within the total pollutant loads necessitates urgent counter-measures against these non-point sources. Point source treatment technology and measures for systematic agricultural nonpoint source reduction are needed, because agricultural nonpoint source pollutants have been shown to have a stronger effect than other sources in the Saemangeum Region. The study area on which the paper is based was initiated in 2010 and focuses on the development of agricultural nonpoint source reduction measures in the Saemangeum Region.

In addition to this Special Issue two more special issues with selected papers of the ICID Gwangju Congress have been prepared. The regular Special Issue that is published after each ICID Congress has been published in Issue 65.2 of *Irrigation and Drainage*. The other Special Issue with selected papers by authors from the Republic of Korea is about to be published.

The Gwangju Congress was a new milestone in the more than sixty years long history of

ICID. For this congress, an impressive number of papers were prepared, presented and discussed. You can find all the papers in the Congress Transactions that have been published by ICID. For detailed information we like to refer to the ICID web site: www.icid.org.

We hope that you will find in the Special Issue as well as in the other publications interesting information that can be of benefit for you in your own research and your practice.

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