



DRAFT

**21st International Congress on
Irrigation and Drainage**

15-23 October 2011
Tehran, Iran

During the Congress, papers are presented and discussed for two Questions, a Special Session, a Symposium, a Seminar, and certain Workshops. For the Questions, authors can submit papers through their National ICID Committees, or through the International Organizations active in the field of irrigation and drainage. For the Special Session, Symposium and Seminar, only one paper per country can be submitted. Details are given in this Call for Papers. The topics for the two Questions, Special Session, Symposium and Seminar are:

Congress Theme: *Water Productivity towards Food Security*

Question 56: *Water and Land Productivity Challenges*

- 56-1:** Water and Land Productivity; Concepts, Indices and Targets
- 56-2:** Innovations, Technologies and Best Practices for Sustaining and/ or Increasing Water and Land Productivity
- 56-3:** Productivity of Low Quality Waters for Irrigation Uses
- 56-4:** Improving Crop Water Productivity under Stressed Environment
- 56-5:** Irrigation and Drainage Management Improvements

Question 57: *Water Management in Rainfed Agriculture*

- 57-1:** Drainage and Flood Management in Rainfed Farming
- 57-2:** Water Harvesting and Conservation
- 57-3:** Supplementary Irrigation
- 57-4:** Rainfed Farm Management

Symposium:

Climate Change Impacts on Soil and Water Resources

Special Session:

Modernization of Water Management Schemes

History Seminar :

Possibilities of Using Traditional Methods in Modern Water Management



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Scopes

Congress Theme: *Water Productivity towards Food Security*

In the last century, the world population has tripled. It is expected to rise from the present 6.5 billion to 8.9 billion by 2050. Water use has been growing at more than twice the rate of population increase in the last century, and although there is no global water scarcity as such, an increasing number of regions are chronically short of water. By 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity, and two-thirds of the world population could be under conditions of water stress. The situation will be exacerbated as rapidly growing urban areas place heavy pressure on local water and land resources.

In most countries, the agriculture sector is the predominant consumer of water. In many cases, irrigated agriculture has played a major role in the development of rural economies, supporting economic growth and poverty reduction.

Although enough food is being produced to feed the world's population, there are still some 925 million undernourished/hungry people in the world. With nearly the same water and land resources base, we shall have to grow enough food to additionally feed about 2 billion people. Considering the increased demand for food resulting from expected increase in the standard of living, we need to double the level of food production. Securing our food supply is not negotiable. We all need safe and good-quality food in order to live a healthy life.

However, increasing water productivity holds the key to future water scarcity and food security challenges. There is scope for an accelerated increase in water productivity. Water productivity in agriculture has increased steadily in the recent decades, largely owing to increasing crop yields, and the potential still exists for further increase. However, the pace of such increase will vary according to the type of policies and investments, with substantial variations in the impact on the environment and livelihoods of rural populations.

21st ICID congress shall provide an opportunity to exchange updated knowledge and researches on Irrigation, Drainage and Flood Management that contribute to enhanced food production with less water, and better protection from uncontrolled flooding.

Question 56: Water and Land Productivity Challenges

Today, agriculture consumes about 70 percent of all global water withdrawn, up to 95 percent in several arid and semi-arid countries. Increasing the efficiency of soil and water use and enhancing agricultural land and water productivity at all levels of the production chains are becoming priorities in a rapidly growing number of countries. A systematic approach to agricultural land and water productivity requires actions at all levels, crops to irrigation schemes, and national to international economic systems, including the trade in agricultural products. It calls for an informed discussion on the scope for improved land and water productivity in order to ameliorate intersectoral competition for water resources and optimize environmental, social and economic outcomes.

No doubt, irrigation should play a greater role to meet the food demand of the 3rd millennium by focusing on land and water productivity, while preserving rural environment. Researchers are invited to submit their papers on the following sub-topics:

56-1: Water and Land Productivity: Concepts, Indices and Targets

Developing Water and Land Productivity Concepts and Indices; Water and Land Productivity Framework; Approaches to Water and Land Productivity Improvement; Impact of Climate Change on Water and Land Productivity Trends; Strategies to Systemically Improvement Productivity; Planning to Enhance the Water and Land Productivity; Role of Various Inputs towards Water and Land Productivity; Measuring Productivity Indices; Productivity Analyzing Methods; Monitoring and Evaluation; Performance Assessment Frameworks; Adverse Impacts of Water Productivity Increase.



56-2: Innovations, Technologies and best practices for sustaining and/ or increasing Water and Land Productivity

Water-Saving Technologies; Innovations on Increasing Water and Land Productivity; Innovations on Soil Fertility Improvement; Effect of Water Pricing Policy on Water Productivity; Techniques on Improving Irrigation Methods; Technology to Improve Water Productivity in Greenhouse Farming; Developing Local Technologies; Adapting Technology According to Farmers Knowledge; Integrating Indigenous Knowledge with Modern Development; Reinvent Irrigation Techniques; Nanotechnology and Bio-Technologies in Irrigated Agriculture; Application of Information Technology (IT) in Irrigation and Drainage; Controlling Pest and other Damages through Sustainable Land Management by a whole of Catchments or Region Approach; Agri-business Food Chain Approach to Improve Productivity.

56-3: Productivity of Low Quality Waters for Irrigation Uses

Sustainable Use of Low Quality Water (LQW) for Irrigation Purposes; Technology for Managing LQW in Irrigation; Measurements of Water Quality; Impact of Low Water Quality on Crop Production; Guidelines, Principles and Policy Frameworks on Use of Low Quality Water; Monitoring and Management of Water Quality; Classification of Low Water Quality; Managing Use of Saline Groundwater and Surface Fresh Water; Adaptation of Crops to Low Quality and Brackish Water; Socio- economical and Environmental Impacts of Using Low Quality Waters for Irrigation.

56-4: Improving Crop Water Productivity under Stressed Environment

Soil – Water Management under Water Stress Conditions; Deficit Irrigation; Evapo-Transpiration Management; Soil Moisture Retention Techniques; Genetically Modified Crops to resist Stressed Environment; Agronomic Enhancement to Cope with Stressed Environment; Improving Soil Fertility Management to Control Land Degradation.

56-5: Irrigation and Drainage Management Improvements

Training and Education; Capacity Building in Irrigation and Drainage; Operation and Maintenance of Irrigation Systems; Performance Assessment of Irrigation and Drainage; Decision Support System; Benchmarking of Irrigation and Drainage Systems; Rehabilitation and Modernization of Irrigation and Drainage Systems; Organizational/Institutional Reforms; Participatory Irrigation Management (PIM); Irrigation Management Transfer (IMT); Comprehensive Research on Irrigation and Drainage Management; Strengthening Accountability for Irrigation Service Delivery; Better Water and land Management.

Question 57: Water Management in Rainfed Agriculture

Sixty Percent of world harvested crops are coming from rainfed agriculture covering 1.2 billion hectares of land. There are also six billion hectares of natural grass land and pastures which are contributing to human food chain. In spite of such a vast rainfed area available to the human utilization, its contribution to the global food security is limited. No proportional efforts have been put forward by governments, international agencies and concerned NGOs to enhance the benefits of such natural resources. Little development has been contemplated to the traditional dry farming in past decades, particularly in developing countries. The productivity of rainfall, so called green water, in these regions is relatively low and there is considerable scope for improvement, through rainfall management, agro-technical and agro-business innovations, investments in infrastructures and technology accompanied by biotechnology enhancement to introduce appropriate varieties of crops.

57-1: Drainage and Flood Management in Rainfed Farming

Spate Irrigation; Drainage Management in Rainfed Agriculture; Bio Drainage in Water Logged Area; Flood Management to Increase Soil Moisture Storage; Controlled Flooding and the Role and Importance of Flood Plane Management in Food Production; Calamity Polders (as Part of Flood Management).



57-2: Water Harvesting and Conservation

Low-Cost Water Storage; Micro Catchments Water Harvesting Systems; Hillside Runoff and Conduit Systems; Floodwater Harvesting and Stream Diversion; Water Harvesting Techniques; Identification of Unconventional Water Resources; Appropriate Technology to Utilize Unconventional Water Resources; Suitable Technology to Utilize Fog; On-Farm Storage of Water Harvested their Design; Management and Economic Viability; Impact of Water Harvesting on Stream Flow and the Environment; Reduction of Water Losses from On-Farm Storage; Application of Mono-layers to Suppress Evaporation Losses.

57-3: Supplementary Irrigation

Appropriate Scheduling for Supplementary Irrigation; Economical Consideration of Supplementary Irrigation; Promote Efficient Pre-Irrigation Techniques; Cropping Strategies to Mitigate Water Scarcity Effects; Small Scale Irrigation Systems such as Promoted in South Africa for Small Enterprises; Drought Planning; Optimal Storage Seize.

57-4: Rainfed Farm Management

Separate Policy for Water Resources in Rainfed Areas; Water and Soil Conservation Methods; Research Strategies for Soil Moisture Potential Enhancement; Improvements in Rainfed Crop Yields; Policy Reform and Infrastructure Investments in Rainfed Areas; Improvement in Rainfall Effectiveness; Applications of Super-absorbers in Rainfed Farming; Modern Technology to Improve the Soil Moisture Holding Capacity including Super-absorbers and Polymers; Biotechnological Methods to Increase Crops Productivity; On-Farm storage; Business Models for Successful Rainfed Agriculture.

Symposium: *Climate Change Impacts on Soil and Water Resources*

A great deal of circumstantial events during the past decade or two suggested that the earth's climate is changing. More importantly, scientific research on climate trends and the Earth's responses during the past 150 years indicate that change is now occurring much more rapidly than during past historical period. There can be little doubt that during the twentieth century, humans altered the Earth's climate by emitting huge quantities of green house gases. If we continue on our present course, life on Earth will be extremely altered. The very sustainability of Earth's life – support system is now in question.

The science of climate predications has improved immensely during the past few decades. New and more refined models, incorporating many of the known feed backs are available. Nevertheless, several important uncertainties in the current numerical models frustrate predication of the climate. Chief among these is the prediction of human behavior.

Climate change may affect the global Food security by altering the existing patterns of water availability and agricultural productivity through the following phenomena:

- Increasing precipitation at higher latitude leading to increased winter/spring runoff and flooding in some areas.
- Decreasing precipitation and increasing drought frequencies at lower latitude countries.
- Sea level rise and associated salt water intrusion could negatively impact agriculture.

The following regions are affected:

- Low latitude, low – income areas will experience the greatest impacts.
- Arid to semi arid region appears most vulnerable to climate change.

How can agriculture adapt to these changes?

- Technological adaptation, such as improved irrigation practices, demand management approaches, development of non conventional water resources, and technological innovations.
- Agro technical adaptation, such as alternative cropping pattern, soil moisture and fertility treatments.
- Government agricultural policies, such as enhancing agricultural insurance policy, manipulating water allocation policies.

Authors are invited to present papers related to these issues of climate change and food security.



Special Session: Modernization of Water Management Schemes

Irrigation is critical to food security and economic growth in the World. The wide gap between actual and desirable performance threatens the sustainability of irrigated agriculture. The challenges for increasing the productivity of irrigation systems have forced countries to think of new strategies. The need therefore is for diagnosis of existing irrigation services and modernization options. Irrigation modernization is defined as "a process of technical and managerial upgrading of irrigation schemes with the objective to improve resource utilization (*labour, water, economics and environment*) and water delivery services to farms; or the transition from supply-oriented to service-oriented irrigation water delivery" (FAO). The current emphasis on technical and managerial upgrading policy has several important implications for irrigation.

Irrigation institutions need to link their central task of providing irrigation services to agricultural production and to integrate their water demands and uses with other users in the basin. An enhanced appreciation of the water delivery and flows across landscapes and the circulation of groundwater within aquifers will lead to informed decisions on the use and reuse of agricultural waters. The concerned agency would like to know how the delivery system and the on-farm irrigation systems are to be managed. In order to exchange updated knowledge and researches on modernization of agricultural water and irrigation schemes, authors are invited to submit papers related to the subtopics mentioned / suggested below :

- Institutional modalities and financial implications;
- Policy and legal implications;
- Modernizing infrastructure;
- Use of GIS & RS for the operation of irrigation systems;
- Monitoring, evaluation and performance;
- Automation of irrigation systems for better operation;
- Applying improved administrative principles and techniques (advanced techniques of data collection methods related to crops, cultivated areas, irrigation requirements, flow measurement devices & water charges);
- New concepts to upgrade irrigation services;
- Capacity development, and;
- Environmental issues.

History Seminar: Possibilities of Using Traditional Methods in Modern Water Management Systems

The development of societies especially in arid and semi-arid areas in the last 5,000 years is closely connected with water management problems. These requirements have shaped the relevant societies and their structures. In the course of the centuries, systems and methods under variable conditions have conclusively demonstrated their sustainability. Today, the knowledge and structural remains of these methods are not only interesting archaeologically and historically, but can also help solve current problems.

Modern water management in many regions of the world has to cope with two particular problems. One problem is climate change and the other problem is population growth including the wish for a higher standard of living in these regions, which leads to constantly increasing demands for water.

In this context, traditional methods, compared with modern technology, offer several advantages in rural areas:

- Sustainability of these methods have already been proved by long experience with them. However, they have fallen into oblivion as a result of "*modernization*" and social changes.
- The methods can usually be implemented with simple means and locally available materials.
- Skilled workers and local people can apply the methods, if necessary after instructions, and later maintain the infrastructure by themselves.
- They are very economical in their consumption of primary energy, use renewable energies and can thus function in a climate-neutral way.
- In a profitability analysis, the traditional methods, for underdeveloped and sparsely populated regions, can have more advantages than "modern" methods.



- Local people feel a sense of self-worth because they are actively engaged in the work with which they can identify themselves.
- If existing remains are integrated, they can be better preserved and the function remains visible.
- Installations in use are more interesting for tourists. Appropriate tourism can be an additional source of income for the region.
- Old methods are often better suited to the natural eco-system. Thus, overuse of existing resources is usually out of the question (e.g. old lifting devices can remove only as much groundwater as is created afresh, unlike electric pumps).
- The methods can, in conjunction with modern systems, open up new perspectives (in the area of irrigation, e.g. the lifting and extraction of water in connection with micro-irrigation).

The seminar will cover all aspects of implementation of traditional methods into modern water management systems: social and structural conditions, possibilities of reconstruction and reintegration, maintenance, benefits and limitations. Good examples and all kinds of messages to show that we can learn a lot from traditional methods.

Key Dates

- National Committees to intimate name(s) of author(s) to the Central Office 01 August 2010
- Submission of comprehensive “*summary and conclusions*” (500-600 words) 01 September 2010
- Intimation of acceptance of “*summary and conclusions*” 15 December 2010
- Receipt of full text of accepted papers 01 March 2011