



PSIPW Research Chair

The recognition and success achieved by the Prince Sultan Bin Abdulaziz International Prize for Water provided the incentive to establish a research chair in its name to focus on rainwater and runoff water harvesting and storage.

The Prize Chair promotes research excellence and the application of advanced technology to realize the best, most economically viable solutions for maximizing benefit from available water resources.

Introduction

The general climate of Saudi Arabia is extremely arid except for very brief periods of torrential rains that flood the otherwise dry valleys and channels. It is, therefore, essential that we derive the maximum benefit from this rainwater and minimize its loss through evaporation which comes as a natural consequence of the region's high temperatures. This can be achieved by employing existing technologies and methods, and by undertaking programs to increase water supply and develop current water resources, specifically through the harvesting and storing of rainfall and runoff water. In this way, we can meet the demands of Saudi Arabia's development programs and growing population, and achieve a surplus of water for future generations.

Various methods for harvesting and storing rainfall and runoff water have been successfully employed in a number of countries by various international organizations. There is a need for further research to improve these methods and adapt them to the particular circumstances of Saudi Arabia. These methods can then be used to strengthen the water sector, which is of strategic importance for Saudi Arabia's development.

Vision

The Chair's vision is to develop and institute techniques and programs that will provide the maximum possible benefit from rainfall and runoff water in order to alleviate serious water deficiencies and narrow the gap between water availability and demand. The Chair will realize this vision by initiating and supporting original and exceptional scientific research related to the harvesting and storage of rainfall and runoff water and by conducting studies to evaluate and develop these methods to adapt them for the particular needs of the region.

Mission Statement

The Chair of the Prince Sultan Bin Abdulaziz International Prize for Water seeks to play a leading role in increasing scientific knowledge and awareness about the harvesting and storage of rainfall and runoff water. The Chair will accomplish this by conducting advanced research and by developing methods that can be instituted on the national level. This will allow Saudi Arabia to derive the maximum benefit from its rainfall and runoff water, which in turn will contribute to solving the country's water scarcity problem. The looming threat of climate change makes these matters all the more urgent. The methods and technologies pursued by the Chair will also provide a nucleus for training a cadre of researchers from our country's graduate students and produce a body of research of a quality commensurate with those of other research centers around the world.

Goals

1. To conduct advanced and specialized research related to the storage and harvesting of rainfall and runoff water and the effects that climate change has on these activities.
2. To attract qualified and distinguished scholars of international repute to conduct research into the problems of harvesting and storing rainfall and runoff water in Saudi Arabia and suggest appropriate solutions for those problems.
3. To promote and inculcate a culture of innovation and originality, to further scientific research that serves development and the economy, and to support means for cooperation and the sharing of expertise between the University and other organizations concerned with water.
4. To exchange knowledge with other specialized research centers.
5. To increase awareness of the importance of water by achieving the maximum possible benefit from rainfall and runoff water in addition to managing water demand.
6. To strengthen to position of the Prince Sultan Research Center for Environment, Water, and Desert so it will play a leading role in research related to the harvesting and storage of rainfall and runoff water on the national, regional, and global level.
7. To publish the results of the Chair's research in top-ranking scientific journals.

Activities

1. Engaging in pioneering scientific research into various aspects of harvesting and storing rainfall and runoff water as well as the effects of climate change.
2. Holding a variety of activities related to the Chair's research areas, including seminars, workshops, and conferences.
3. Supervising masters-level and doctoral research in cooperation with the relevant departments of the university.
4. Establishing and equipping an advanced laboratory to serve the Chair's various research needs.
5. Designing physical and computer models that effectively communicate the Chair's research output.

Inauguration

The charter for the Chair was ratified on 19 July 2008 and was inaugurated on 1 November 2008 during a formal ceremony held under the patronage of His Royal Highness Prince Khalid Bin Sultan Bin Abdulaziz, Assistant Defense Minister for Military Affairs and Chairman of the Prize Council for the Prince Sultan Bin Abdulaziz International Prize for Water.

1st Research Program

The main objective of this project (conducted between 2009-2012) was to propose methodologies, mathematical models, and field application design procedures for enhancing the yields from rainwater harvesting methods, including groundwater recharge, in convenient locations within wadi courses.

It had a number of specific objectives that can be summarized in the following points:

1. Identification of suitable rainfall harvesting locations within Saudi Arabia, starting with a pilot project in the Riyadh area.
2. Development of an effective rainfall harvesting design and its subsequent application in the field.
3. Development of a suitable mathematical model inclusive of boundary and initial conditions.
4. Effectiveness assessment of various methods used for rainfall harvesting and groundwater recharge.
5. Generalization of the research approaches, methods, modeling techniques and experience acquired locally so that it can be applied to other potential rainfall harvesting locations in Saudi Arabia.
6. Assessment of the storage of harvested rainwater using various assessment techniques.
7. Employment of climate change downscaling models to identify rainfall patterns for every location in Saudi Arabia up to the year 2050.
8. Production of monthly rainfall maps for various purposes, such as flood patterns, inundation, agriculture, urban population concentration, and migration.
9. Monitoring of groundwater levels and quality fluctuations in groundwater mixture solutions.

Timetable of Primary Research Program

Task name	2009				2010				2011				2012			
	03	06	9	12	03	06	9	12	03	06	9	12	03	06	9	
Office work	█															
Preliminary field work			█													
Historic data Collection			█													
Geologic and geophysical works				█												
Rainfall intensity spatial and temporal patterns					█											
Analytical model for runoff					█											
Surface water impoundment						█										
Groundwater monitoring				█												
Climate modeling and future predictions of rainfall and runoff							█									
Rainfall-runoff modeling								█								
Rainfall harvesting prototype design						█										
Rainfall harvesting unit field performance measurements							█									
Rainfall harvesting model and system verification										█						
Final report preparation												█				
Report submission														█		

Education and Training Programs The aim of the program is to provide the students with the knowledge and skills required for the development of the harvesting and storage of rainfall

Local, Regional and International Cooperation

The Chair cooperates with a number of official bodies within Saudi Arabia, including: the Ministry of Water and Electricity, the Ministry of Agriculture, King Abdulaziz City for Science and Technology, the General Presidency for Meteorology and Environmental Protection, the Ministry of Municipal and Rural Affairs, the Ministry of Economics and Planning, the General Survey

Authority, the Saudi Geological Survey, various universities, and numerous research centers.

The Chair cooperates with a number of regional bodies, including: The Arab Center for the Study of Arid Zones and Dry Lands (ACSAD), the International Center for Agricultural Research in the Dry Areas (ICARDA), and the Desert Research center in Egypt.

The Chair's cooperation with international bodies includes: the United Nations Convention to Combat Desertification (UNCCD), the Network for Drylands Research and Development (NDRD), the United Nations Environment Programme (UNEP), and UNESCO.

Beneficiaries of the Chair's Research

1. Universities
2. Ministry of Water and Electricity
3. Ministry of Agriculture
4. Ministry of Economics and Planning
5. General Presidency for Meteorology and Environmental Protection
6. General Survey Authority
7. Saudi Geological Survey
8. Various national, regional, and international research centers.

Professor of the Chair



Professor Zekai Sen

Professor Zekai Sen was born in 1947 in Kastamonu, Turkey.

He won the Nobel Peace Prize in 2007 along with the other members of the research team working on the United Nations Intergovernmental Panel on Climate Change (IPCC).

He has been awarded numerous other medals and scientific prizes, both locally and internationally.

He is the president of the Turkish Water Foundation.

Education:

* Ph.D. in Stochastic Hydrology, Imperial College, University of London, 1974

* M.Sc. in Engineering Hydrology - Imperial College, University of London, 1973

* Diploma of Imperial College (DIC), 1972

* M.Sc - Technical University of Istanbul, Civil Engineering, Department of Reinforced Concrete, 1972

Academic Appointments:

He is currently a professor at the Technical University of Istanbul, Civil Engineering Faculty, Department of Hydraulics and Water Power. He teaches a number of courses in various water-related fields on the undergraduate and postgraduate level. He also supervises a number of research theses and dissertations.

He was a full professor at the Faculty of Earth Sciences at King Abdulaziz University in Jeddah from 1984 to 1986.

Since 1977, Professor Sen has made significant contributions working as a consultant for a number of regional and international organizations.

