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Aqua Foundation
10th World Aqua Congress
International Conference
24 - 25 November, 2016, New Delhi, India

Theme: Water - Smart Solutions for Growing India

Organized by:
Aqua Foundation
Aqua Foundation is a Non-Governmental Organization working on key aspects of Water, Environment & Humanity. The ever balanced, ever harmonized cycles & arrangements of nature have been greatly challenged and disturbed by humans in last century, which in turn pose a threat to their own survival. The organization is working to reverse these damages and work towards a sustainable living, in oneness with fellow humans, other living beings, plants and nature. The ultimate goal of the organization is to ensure humanity’s long term future.

The activities of Aqua Foundation include knowledge creation, information dissemination, research and education. The organization works through a diverse range of tools and techniques including, but not limited to, conferences, seminars, training programs, on-line learning, capacity building, community projects, school activities etc., with prime focus on Humanity and Sustainability.

Aqua Foundation is organizing international conference ‘World Aqua Congress’ since year 2007. The conference aims to bring various stakeholders i.e. policy makers, researchers, academicians, industry, NGOs etc., on a common platform for meaningful discussions & deliberations and implementation & execution. ‘Aqua Excellence Awards’ are also key highlight of the two days international conference. These awards are given to promote, encourage & recognise innovations and contributions in the field of environment & humanity.

Globally competition over freshwater resources has been increasing during last decades due to a growing population, economic growth, increased demand for agricultural products for both food and non-food use, and a shift in consumption patterns.

India is growing...practically in every aspect. At 7.6%, India is the fastest-growing economy in the world today. With booming economy, people’s expenditure patterns change and so do their lifestyles. Rapid urbanization is also adding fuel to these changes. As a result, food consumption patterns are changing—changes a traditional country like India would not have imagined a few decades ago. The changing food consumption patterns are so significant that they have a considerable impact on future food and water demands. India also has a significant spatial mismatches between its populations and its water resources; less water is available in places where more people live and much of the food is grown. Thus, the manner in which India meets its increasing food and water demands has been the major focus of many recent food and water demand projections both at the global scale and at the national scale. According to a report by the 2030 Water Resources Group, India’s water requirement will be about 1,498 BCM in 2030, which is double of the estimated aggregate water demand at present. But water balances for the country as a whole are of limited value since they hide the existence of areas of acute water shortage and do not reflect problems of quality.

India faces major challenges in the water sector with the per capita availability going down and demand growing due to urbanisation and industrialisation. Inefficiency of water use in agriculture, over-exploitation of underground water and contamination are other issues associated with water management in the country.

All these studies and research univocally says that it can not be ‘business-as-usual’ if India has to meet food and water demand and aspirations of its growing population. Smart solutions are urgently needed to holistically address to ensure adequate water supply for a growing India.

While there is a wide recognition that around 54% of India faces high to extremely high water stress, smart solutions and sound approaches to the utilization, conservation, protection and administration of the resource are yet to be implemented.

The objective of the 10th World Aqua Congress was to bring various stakeholders on a common platform, highlight smart solutions in various sectors, discuss inclusion of these solutions in policy framework and work towards ensuring a more sound future for the world we leave to our children. Accordingly, the Congress was targeted at natural and social scientists, practitioners, and technological innovators, as well as policy and decision-makers, financial stakeholders and investors, legal and regulatory specialists, and groups involved in capacity building.

------------- : Guest of Honour : -------------

Dr. Sunita Narain
Director General, CSE
Following themes broadly described the focus areas of deliberations, with a certain degree of overlapping. The structure had been deliberately kept flexible and evolved depending on research contributions received from participants.

**Water Resources: Availability, Management, Quality**
- Status of Water Resources
- Water Quantity- Gaps in Demand & Supply in Various Sectors
- Water Exploration & Management- Latest Trends in Surface & Ground Water
- Hydrological, Hydro-geological, Geophysical, Remote Sensing and GIS Tools
- Additional Resource Creation (such as Rain Water Harvesting, Recycling etc.)
- Population Growth, Urbanization, Economic and Industrial Development
- Global Climate Changes & Impact on Water Resource Management
- Water Quality Criteria for various Uses-Present Status
- Water Quality Management

**Water, Sanitation and Health**
- Safe and Affordable Drinking Water for All
- Adequate and Equitable Sanitation
- Water and Public Health
- Decentralizing Water Supply Systems
- Water Leaksages, Wastages, Poor Water Management

**Wastewater Management & Reuse**
- Water technologies
  - Water/ Wastewater Treatment
  - Water Reuse & Recycling
  - Water Quality Management
- The Circular Economy – Reduce, Remove, Reuse

**Emerging Technologies & Concepts**
- Nature-based Solutions for Water Sector
- Green Infrastructure
- Adaptive Water Management
- Water/ Wastewater Treatment, Water Re-use & Recycling
- Water Quality Management
- Drinking Water: Purification, Bottling, Supply
- Salinity Management, Desalination
- Latest Technologies in Water Exploration and Management
- Software for Water Exploration/ Management/ Modeling
- Rainwater Harvesting
- Ground Water Management & Modeling
- Technologies for Irrigation and Agriculture

**Enhancing Water Use Efficiency**
- Water Leakage Prevention Technologies
- Utilities and Utility Management
- Sea Level Rise and Coastal Zone Management
- Preserving Oceans & Other Water Bodies as Carbon Sinks

**Smart Water Solutions for Smart Cities**
- Efficient Water Distribution Systems & Reducing Water Loss
- Grey water use
- Ground Water Exploration & Management
- Rainwater Harvesting, Water Reuse, Recycle and Efficient Use
- Storm Water Management Solutions
- Revival and Preservation of Traditional Water Conservation Structures
- Rivers & Water Bodies Conservation
- Sustainable Water Management Practices
- Water Quality Management

**Financial, Institutional, Legal & Policy Issues**
- Water Policy and Water Usage Reform
- Water Rights, Pricing & Laws
- Government’s Role in Water Management
- Water Access as a Fundamental Right
- Laws to Prevent Pollution of Water Bodies & Aquifers
- Municipalities and Sustainable Water Management at Local Level
- Water Infrastructure – Investment and Financing
Session Chair Persons

Dr. D. K. Chadha  
Ex-Chairman-CGWBI & President, CWBI

Er. Vivek P. Kapadia  
Chief Engineer, WRD  
Gujarat

Mr. Samit Ray  
Director  
Government Affairs & Public Policy,  
United Technologies Corporation

Prof. P. S. Datta  
Ex-Project Director  
NRL, IARI

Prof. K. G. Moodley  
Honorary Research Professor  
Durban University of Technology  
South Africa

Dr. Vineet Gahlaut  
Head  
National Centre of Seismology  
MOES

Key Note Speakers

Dr. B. R. K. Pillai  
Commissioner  
(Command Area Development)  
MOWR, RD&GR, GOI

Shri A. B. Pandya  
Former Chairman, CWIE & Consultant, WAPCONS

Dr. Pratibha Sharma  
Former Principal Scientist & Professor, ICAR-IARI

Dr. S. K. Malhotra  
Agriculture & Horticulture Commissioner, GOI

Prof. P. S. Datta  
Ex-Project Director  
NRL, IARI

Mr. Pawan Kakkar  
Director, Jugapro  
New Delhi

Prof. P. S. Datta  
Ex-Project Director  
NRL, IARI

Mr. Deeraj Kumar  
Maccaferri

Ms. Chethana Basavanna  
Head Water Solutions  
Enzen

Mr. Andrew Townsend  
Engineering Sales Director  
Micromet

Mr. Rob Richardson  
Consulting Engineer  
Hydro-Dics

Mr. Anuj Sharma  
COO, Piramal Water Private Ltd.

Mr. Safeer Usman  
Founder & CEO  
TetherBox Technologies  
Bangalore

Tech Talk

Authors

Er. R. K. Khanna  
Former Chief Engineer  
Central Water Commission

Dr. Subhash C. Singh  
Sr. Geophysicist  
CGWB, Bhopal

Dr. Sayed Waliullah Aqili  
Water Resources Manager  
CRIDA, Afghanistan

Dr. Babar Ali Shah  
Jadavpur University, Kolkata

Dr. Dewashish Kumar  
Sr. Scientist & Asst. Professor  
CSIR-NGRI

Mr. Amit Khatri (I.A.S.)  
Additional Commissioner  
Municipal Corporation  
Gurgaon

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Ms. Kamala K. C.
HOD, WASH, ACF International Nepal

Er. Chandan Kumar
Project Coordinator (WASH &DRR)
Save The Children, India

Mr. Ranjib K. Padhi
SO, IGCAR
Chennai

Prof. Pramod K. Pandey
University of California

Mr. Shikhar Sharma
Head (Plant & Environment)
CleanFlo India

Dr. Hema Diwan
Asst. Professor
National Institute of Industrial Engineering, Mumbai

Dr. Abhijit Maiti
Asst. Professor, I.I.T.
Roorkee

Dr. P. K. Parhi
Asst. Professor
Central University of Jharkhand Ranchi

Ms. Meghal Arya
Associate Professor
CEPT University

Dr. Sunesh Sharma
Sr. Scientist & Assistant Professor
Himmatnath Society-TATA Trust Dehradun

Mr. Girish Chandra Mishra
Director
Saviram Engineering Consultants
Noida

Dr. Kumud Raj Kafle
Asst. Professor
Kathmandu University
Nepal

Prof. D. S. Malik
Head
Gurukul Kangri Vishwavidyalaya
Haridwar

Ms. Girija Satish Mulay
Sr. Hydraulic Modeler
MWH Global, Pune

Ms. Bharti Nanjar
Program Coordinator
Water Resource Unit
Sahyog, Gujarat

Ms. A. Rajeswari
Research Scholar
Gandhigram Rural Institute
Tamil Nadu

Ms. E. Jackcina S. Christry
Research Scholar
Gandhigram Rural Institute
Tamil Nadu

Dr. G. S. Dwarakish
Professor & Head
NIT, Surathkal
Karnataka

Ms. Girija R.
Consultant
CDD Society, Bengaluru

Mr. Aditya Venkatachalam
Head, North India Division
Hindustan Ecooff, New Delhi

Ms. Isha Dash
Asst. Project Manager
CDD Society, Bengaluru

Dr. Bolisetty Sreenath
Scientist, ETH
Zurich

Mr. Snigdhadip Ghosh
Research Scholar
N.I.T., Durgapur

Mrs. Indu Gupta
Founder
Paryavaran Shiksha Prasar Saniti
Moradabad

Mr. Dalbir Singh
Senior Fellow
Institute of Development Studies Jaipur

Mr. Pravin Muchhadiya
Team Leader - Water Resource Unit
Sahyog, Gujarat

Ms. Minashree Kumari
Research Scholar, ISM
Dhanbad

Prof. Pramod K. Pandey
University of California
Recommendations of 10th World Aqua Congress

- The work related to water is being dealt by many Ministries and Departments but there is no co-coordinating mechanism. Such a mechanism needs to be set up immediately and MOWRRD & GR should be empowered by enacting suitable legislations like the National Water Framework Law urgently.
- A national level empowered body, involving various stakeholders and ministries dealing with issue of water, is of prime importance, for proper coordination on this critical aspect. The concerned ministries like Ministry of Water Resources, Ministry of Agriculture, Ministry of Earth Sciences, Ministry of Drinking Water & Sanitation, Ministry of Environment, and any other ministry or department dealing with water must be part of this group.
- National level guidelines for usage of surface water and ground water may be formulated and implemented strictly.
- For proper ground water management, aquifers need to be understood. Nationwide aquifer mapping program should be made top priority using latest tools and technology, including airborne and ground geophysics, modeling etc.
- There is a lack of awareness regarding the growing scarcity of water. Such awareness needs to be created in various user groups like farmers, women, children and even domestic helps.
- Address guidelines on waste water discharge-stringent quality norms for different types of discharge, make reuse mandatory.
- The climate change is real and thus the looming water crisis in India must become the focal point of our policy making now. Given the fact that most of India saw a drought in early spring and devastation from flooding only a few months later in the same geographical area, conservation of every single drop of rain must become a national priority. We might continue to see heavy rainfall, however the number of rainy days is fast shrinking and the downpour is changing patterns, getting more intense and short lived. Traditional rain water harvesting methods need to be augmented with modern technologies in storm water management on a war footing.
- Online monitoring and automation of wastewater treatment plants will lead to minimal cost of water treatment, leading to more people voluntarily treating water.
- Encourage more scientific research on traditional water systems, not just individual water bodies.
Aqua Foundation's Excellence Awards 2016

The "AF's Excellence Award" are the highest award given by Aqua Foundation to its members & stakeholders in recognition of their outstanding achievements in the field of Nature. Aqua Foundation honours, in each World Aqua Congress, individual / nominees of corporate members who have made a mark in their respective fields of expertise or have made a significant contribution towards the Water & Environment Conservation Techniques.

The awardees of Aqua Excellence Awards for year 2016:

Dr. Sunita Narain
Life Time Achievement

Mr. Ramesh Sharma
The Scindia School, Fort, Gwalior
Work on Traditional Wisdom

Mr. Ramesh Sharma
The Scindia School, Fort, Gwalior
Resource Management (Institutional)

Dr. Anuradha Singh
Sushila Model School
Holistic Development of Angels of Humanity

Shri A B Pandiya
Outstanding Contribution Towards Cause of Sustainability (Social Sector)

Shri Man Mohan Madan
Professional Excellence (Individual)

Dr. Anoop Kumar Srivastava
Professional Excellence (Individual)

Dr. Naveen B. P.
Academic Excellence (Individual)

Dr. G.S. Dwarakish
Academic Excellence (Individual)
Shri Nimai Lila Das
Govardhan Eco Village
Protection of the Quality and Supply of Freshwater Resources
(Social Sector)

Dr. D. K. Chadha
Global Hydrogeological Solutions
Excellence in Resource Management
(Institutional Sector)

Prof. (Dr.) Davendra Singh Malik
Academic Excellence
(Individual)

Mr. Naresh Paliwal
Dalmia Chini Mills, Unit-Ramgarh
Excellence in Resource Management
(Industrial)

Mr. Dipak Behera & Mr. Adarsh Agrawal
OMQ Division, Tata Steel Limited
Sustainable Development in Mining Sector

Mr. Rampraveen Swaminathan
International Paper APPM Ltd.
Outstanding Contribution towards the cause of Sustainability
(Private Sector)

Mr. R. G. Agarwal
Dhanuka Agritech Limited
Outstanding Contribution towards the cause of Water Sustainability
(Private Sector)

Mr. Samarakoon Banda
VS Consulting (Pvt) Ltd.
Sustainable Development in Hydropower Sector
(Private Sector)

Mr. Gaurav Prakash Raja
Daanih Chini Mills, Unit-Ramgarh
Excellence in Resource Management
(Industrial)

Dr. P. Jegathambal
Karunya University
Excellence in Development of Technology
(Individual)

Dr. K. Parameswari
Karunya University
Excellence in Development of Technology
(Individual)

Dr. S. Vinodha
Karunya University
Excellence in Development of Technology
(Individual)

Ms. Neha Paul
D.C. Water World Supermart Ltd.
Excellence in Development of Technology
(Industrial Sector)
VIII WAC 2014' HIGHLIGHTS

Messages

New Delhi
29th October, 2016.

Message

The Honourable Vice President of India is happy to learn that Aquafoundation is organizing 8th World Aquacongress on the theme "Water – Smart Solutions for Growing India" on November 24 – 27, 2016 in New Delhi. I诚安，南Dhi

The Vice President sends his greetings and congratulations to the organizers and participants and wishes them success.

(Sanjivini Kakar)

Message

Dr. S.K. Bhushan
Chairman, MSSRF
Former Chairman, Central Water Board

I am indeed very happy to note that 8th World Aquacongress – International Conference is being organized by The Aquafoundation as Prime Mover "Water - Smart Solutions for Growing India" on 24 & 25th November, 2016. Conferences of such magnitudes provide a great opportunity to apprise humanity, especially to water managers and policymakers, on new ideas and innovations in water management.

It is the responsibility of water managers and policymakers to ensure water resources are adequately conserved and continuously improved.

The theme of the conference is "Water – Smart Solutions for Growing India".

I wish the Conference great success.

(S.K. Bhushan)

Message

Dr. S.K. Jha
Director General, National Water Mission

I can feel that the theme of the conference is very much relevant in today’s scenario. The theme "Water – Smart Solutions for Growing India" is highly relevant and timely. I congratulate the organizers for organizing such a great conference in today’s scenario.

I wish them all the success and hope that the outcome of the conference leads to a healthy and sustainable society.

(S.K. Jha)

Message

Dr. D. Prabhu
Director General, National Water Mission

I am pleased to know that the Aquafoundation is organizing 8th World Aquacongress on the theme "Water – Smart Solutions for Growing India" on November 24 – 27, 2016 in New Delhi. It is a great opportunity for me to address the gathering and share my thoughts on the importance of water conservation and sustainable water management.

I wish them all the best and hope that the conference leads to a healthy and sustainable society.

(D. Prabhu)

Message

Mr. S.S. Jha
Director General, National Water Mission

I am pleased to know that the Aquafoundation is organizing 8th World Aquacongress on the theme "Water – Smart Solutions for Growing India" on November 24 – 27, 2016 in New Delhi. It is a great opportunity for me to address the gathering and share my thoughts on the importance of water conservation and sustainable water management.

I wish them all the best and hope that the conference leads to a healthy and sustainable society.

(S.S. Jha)
Hydro-Dis® congratulates the organizing committee for organising such a fantastic event. Our attendance at the Congress enabled us to gain a significantly improved understanding of the challenges faced by India to use, manage and invest in water to facilitate the Growth of India.

Mark Carey
Managing Director, Hydro-Dis Australia

We appreciate you and your team for organizing the conference, the conference deliberated on very important issues concerning the water crisis and brought together different expertise from across the country and discussed on many technologies/strategies to deal with. We are happy and thankful for the opportunity given.

Girija S. Mulay
Sr. Hydraulic Modeller, MWH Global, Maharashtra

It’s a very good decision to choose topic from ‘Reviving Traditional Water and Environment Conservation Techniques’ held in year 2015 to ‘Water: Smart Solutions for Growing India’, in year 2016. It is a very good direction.

Chandran Babu
Manager, Canar Geo survey Services Kingdom of Bahrain

Congratulations to the organizing team for a wonderful program.

Dr. S. K. Malhotra
Agriculture and Horticulture Commissioner, Ministry of Agriculture and Farmer’s Welfare

Very well organized and run. Excellent diversity of subjects and papers.

Rob Richardson
Consulting Engineer, Hydro-Dis Australia

The conference has been very informative and innovative.

M. C. Ram
EE (C)
Delhi Jal Board

It was really good experience. I wish we could organize this kind of event in Nepal with joint effort.

Dr. Kamala KC
HOD, Action Contre La Faim WASH, Nepal

Thank you very much for conducting such a well organized event. It was a grand success and a great learning experience.

Yogesh Sharma
Ex-Director MoEF and Ex-Advisor, NMCG

Thanks a lot for allowing me to be a part of your community

Dr. Vineet Gahalaut
Head Seismology
Ministry of Earth Sciences

The event was wonderful. It was good to connect with so many people from the water world.

Kriti Sohel Golwalla
Marketing Coordinator
Kamstrup Metering Solutions Pvt. Ltd.

I would like to congratulate you and your team for successfully conducting the 10th world Aqua congress.

Dr. G. S. Dwarakish
Professor and Head, NITK Surathkal, Karnataka

Commendable and a very well organised program. It all ran very smoothly. I learnt many new things at the conference and in that sense it was a success for me.

Dr. Meghal Arya
Architect
Arya Architects
CEPF University

It was indeed a mesmerizing experience.

Rajesh Kapoor
Sales Manager, Jugapro India

Thanks for Very Well organized Conference in terms of all segment of management. It was a pleasure to be part of this World Aqua Congress conference.

Er. Chandan Kumar
Save the Children, India
“If you cannot love each other, you cannot achieve your goal”