Association of Global Groundwater Scientists (AGGS)

Alais International Groundwater Congress (IGWC) (Registered No.1/2013, Dated: 04.01.2013, Tamil Nadu Societies Registration Act 1975)

Administrative Office: Located at Coimbatore, Tamil Nadu, India

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Inside this Issue

Messages

Background

Scopes

Vision

AGGS Past Events

Upcoming Events

IGCs Over the Years

AGGS Committee

Felicitation

AGGS Journal

Membership Form

Message from Dr. M. Thangarajan, Founder IGWC alias

It is indeed very happy to note that IGWC alias AGGS is bringing out its E Newsletter for the benefit of our members. Our forum was started after the successful organization of IGC-2002 at Dindigul, Tamil Nadu during February 20-22, 2002. The forum was renamed as IGWC during IGC-2011 and subsequently it was changed to Association of Global Groundwater Scientists (AGGS) to attract more members from abroad also and it was registered during first week of January 2013. The forum is organizing periodically both international events as well as National events through host institutes from 2006 onwards. The Annual General body meeting is being organized during every IGWC events and the forum's future events and annual budget also presented there. We had started the Journal of Groundwater Research (JGWR) from 2012 onwards with Prof. V. P. Singh as its Editor in Chief and Dr.MK. Singh as its Associate Editor in Chief. There was a big expectation from most of the AGGS members that we should bring out E Newsletter to share all members' personal information like promotion, awards etc. as well announcement of AGGS program and other forums conference etc. The matter was discussed during the last AGM meeting during IGWC-2019 at the Department of Hydrology, IITR, Roorkee and decided to start the E Newsletter with immediate effect. An editorial Board was formed for this purpose and they have started the work to bring out the first E Newsletter during the INGWC-2020 at CWRDM, Calicut.

> ***"The main mission of our forum is that let us all join together to find a more innovative way of selecting high yield wells in crystalline and basaltic terrain, assess the reliable recharge potentials through various methods, augment the groundwater system through artificial recharge method, remediate the contaminated groundwater system with simple technology, apply various modeling technique for the assessment and management of water resources and create awareness among rural folks to use the limited dynamic resource optimally and reserve the static reserve for future generation."***

As the Founder, I feel very much proud that our Forum has brought out the much awaited E Newsletter for the benefit of all AGGS members and request you all to share your views of your personal information as well bring out important topics like innovative technology which could be used for the Assessment, Modeling and Management of Groundwater Resources. I would like to congratulate to all those who worked very hard to bring out this important Newsletter.

Editorial Desk:

We are happy to release this first issue of the AGGS e-Newsletter. There is no preceding edition of this AGGS newsletter. This new issue is the first kind of AGGS and the entire credit goes to the team members for their hard works, which are being built upon since last two decades' history of AGGS. In this issue, we have discussed our association roots and maintained a lot with an untired effort, and admired. The main focus is to integrate the backgrounds of AGGS and its activities carried out upto 2019. We would thank all the members of AGGS who have contributed within a very short span of time to give a shape of this newsletter.

Drs. Brijesh Kumar Yadav (Chief editor), N. C. Mondal (Co-editor), M.K.Singh (Member), C.P.Priju (Member) & S. N. Rai (Special member)

Background of AGGS

CSIR-National Geophysical Research Institute (NGRI), Hyderabad organized an International Groundwater Conference (IGC-2002) during January 31st to 3rd February, 2002 at Dindigul, a rural Town in Tamil Nadu, India. The conference was one of the most success one and ever organized in a rural sector. Dr.M.Thangarajan (Scientist-G at CSIR-NGRI) had organized the conference from NGRI side and got superannuated within two months after the Conference. The success of the conference motivated him to organize many more conferences at various centers in India. In organizing many such conferences IGC/IGWC, he identified host institute, prepared the brochure for that conference, circulating and mobilizing the abstracts and manuscripts as well advising the organizing committee in the preparation of Abstract and pre-& post- conference proceeding volumes.

The second one IGC-2006 was organized by the School of Environmental Sciences at Jawaharlal Nehru University (JNU), New Delhi during the first week of February 2006. Prof. A.L.Ramanathan of JNU organized it under the able guidance of Dr. M. Thangarajan (Conference Coordinator). Most of the delegates who attended the IGC-2002 also attended IGC-2006. It was also a very successful conference at the Capital of India. The success of IGC-2006 triggered Dr. Thangarajan, Prof. D. C. Singhal (IITR, Roorkee) and some more senior members to go for the registration of the forum viz., International Groundwater Congress (IGWC) at New Delhi and the responsibility was given to Prof. Ashok Keshari of IITD, New Delhi.

The third one IGC-2007 was organized by the Water Technology Centre (WTC) at Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu. Dr. K. Palanisami of WTC organized it under the guidance of Dr. M. Thangarajan. It was a very big conference both in terms of papers (460) and number of delegates (400).

It was decided to organize IGC-2009 in commemoration with the diamond Jubilee celebration of the Department of Geology at Pune University, Pune during the second week of September 2009. At the same time, IAH & IAHS Annual Convention was also planned at Hyderabad. Many foreign and Indian members who belong both in IAH and IGC forum requested to postpone IGC-2009 for a year as it may affect the IAH & IAHS convention at Hyderabad. It was sacrifice IGC Conference for the sake of IAH & IAHS. There was no IGC conference during 2009 but organized the IGWC-2011 at Madurai.

During 2010,Dr.C.Mayilswami had joined with Dr. M. Thangarajan to help him (MT) in carrying out further the IGC activities. The registration of the forum could not take place irrespective of many reminders to Dr. Ashok Keshari. After 2010, the IGC was renamed as IGWC (international Ground Water Conference) and the future events will be labeled as IGWC events.

The fourth one was named as IGWC-2011 which was organized at Madurai and Dr. P. S. Navaraj was the organizing Secretary and Dr. M. Thangarajan was the advisor cum Conference coordinator. It was well organized even though the size of the conference was not big comparing with the earlier conferences. Dr. M. Thangarajan could convince Prof. V.P.Singh of USA to participate the conference and after that he has become a regular IGWC participant.

During this conference, it was decided to form an interim/ad-hoc committee to run IGWC affairs and Prof. L. Elango of Anna University, Chennai was nominated as the ad-hoc President and Dr. C. Mayilswami as the acting Secretary cum Treasurer and with a few more members and the committee was looking after the events with the major advice received from Dr. M. Thangarajan as the advisor who had motivated the forum and was running it successfully till 2016.

Dr. Thangarajan motivated IGWC-2012 at Aurangabad with the help Dr. P. S. Kulakarni of Maulana Azad College of Science & Technology, Aurangabad. It was a very successful event. During the conference, Dr. Ashok Keshari informed that he could not do the registration of IGWC due to stringent IIT rules. It was during AGM meeting of IGWC at Aurangabad, the ad-hoc committee took a decision to register the IGWC forum at Coimbatore with the help of Dr. C. Mayilswami. It was also decided to release Journal of Groundwater Research (JGWR) with few selected papers from the conference with the help of Prof. V.P.Singh as Editor in chief and Dr.M.K.Singh as Deputy Editor in chief.

While finalizing the procedure to take up the registration of the forum, some members suggested that it would be ideal to rename the forum as the Association of Global Groundwater Scientists (AGGS) so that we can attract foreign members also to the forum. Registration responsibility was taken over by Dr. M. Thangarajan, Dr. P. S. Kulkarni and Dr. C. Mayilswami. After a very hectic task, the three-member committee finalized the draft bye laws of the forum viz., AGGS and circulated among members for their feedback. The committee had received few suggestions which had been incorporated and got registered during the first week of January 2013. The ad-hoc committee members continued as the interim committee in the registration document also. After the registration, it was started admitting members as

life member by paying Rs. 5000/- as life term fee for normal age group and Rs. 2500/- for senior citizens. The membership drive started from 2013 onwards and initially Dr. M. Thangarajan played very important role in mobilizing members of IGWC by contacting well-wishers and supporters of IGWC, and followed by Dr.P.S.Kulkarni who could admit many GEOFORUM members in to AGGS. Prof.V. P.Singh also helped in mobilizing a few members from USA, Canada and Australia.

During 2015, Dr. Sivakumar Bellie of Australia and Prof.V.P. Singh prepared a draft blue print which provided guide lines how to select awardees for various schemes as well total bye laws for the association except how to mobilize members for the forum.

The Ad-hoc executive committee started during 2011, also continued their service till February 2016 until a new elected committee took over during February 2016 with Prof. B. Venkateswara Rao as the President and Dr. C. Mayilswami as its Secretary-Cum-Treasurer and Dr.P. S.Kulkarni as its Vice President and Prof.V. P.Singh as Vice President for foreign affairs. It is very clear there is no new forum started and got registered and it is only renamed and the same set up of 2002 is working. The logo of AGGS is very ideal as it is started 2002. It got registered under AGGS during 2013 only as suggested by some members.

During 2014, it was planned to organize IGWC-2014 at Andhra University, Visakhapatnam and initial work was started and the first core committee meeting was also conducted to chalk out the program but unfortunately Telangana agitation to bifurcate Andhra Pradesh and Telangana took violent turn and after taking the stock of situation EC decided to shift the conference to SRM University (Private University) at Chennai and to organize it during December 2015.All efforts were put to organize IGWC-2015 in a big manner but due to various constraints and Chennai rains during December 2015, it was postponed to February 2016. Prof. C. Mayilswami coordinated the work from AGGS side and it turned to be a moderate one due to postponement.

During AGM at SRM University, Chennai, the new committee took over the charge. Prof. B. Venkateswara Rao took over the President and Prof. C. Mayilswami took over as Secretary-Cum-Treasurer of EC. There are other members also took charge as the EC and other senior members had agreed the suggestion of Dr. Thanagrajan to elect a new EC through election process.

The IGWC used to be organized once in two years but EC decided to organize the national conference as various places during even year and IGWC during odd years. Dr. B. Venkateswara Rao agreed to organize First INGWC 2016 at JNTUH, Hyderabad and Dr.N.C.Ghosh to organize the IGWC 2017. The First Indian National Conference (INGWC-2016) was organized at JNTUH by Dr. B. Venkateswara Rao (President, AGGS) during the first week of October 2016 and it was a successful venture. During the AGM, second INGWC 2018 was allotted to Jalgaon and Dr. Uday Kulkarni from Moolji Jaitha College, Jalgaon, Maharashtra agreed to organize the same.

The seventh IGWC-2017 was organized by NIH, Roorkee at New Delhi which was one of the most successful both in terms of number of papers, delegates and one of the best local hospitality provided by the organizers. Dr.N C. Ghosh and Dr. Anupama Sharma of NIH, Roorkee had done creditable job for the success of the conference. Though AGGS's involvement was minimal, many AGGS members as well CGWB scientists attended the conference. It was very surprising to us that there were many CGWB delegates who attended the conference are Dr. Thangarajan's fans and he was like a star of attraction among the delegates. During the AGM meeting, the revised blue print was approved by the EC.

Even during 2017, it was planned to organize IGWC-2019 at JNU, New Delhi by Prof. A. L. Ramanathan and which was not materialized due to Dr. A. L.Ramanathan became Dean, School of Environmental Sciences and busy with administrative works. As suggested by him, the IGWC 2019 was shifted to IIT Gandhinagar supposed to organize by Dr. Manish Kumar and finally cancelled due to administrative reasons. Then, Dr. Brijesh Kumar Yadav, Department of Hydrology, IITR under the guidance of Dr. Dinesh Singhal voluntarily came forward to organize IGWC 2019 at Department of Hydrology, IIT Roorkee. It is also a very successful conference organized in the history of AGGS.

During AGM held at Moolji Jaitha College, Jalgaon, Maharashtra, the third INGWC 2020 was allotted to CWRDM, Calicut and is to be held on February 18-20, 2020.

In nutshell, the AGGS was started by Dr. M. Thangarajanwho is rightly called as Founder of IGWC alias AGGS. Since AGGS is only a renamed from IGC/IGWC and its establishment started on February 2002. The logo of AGGS was prepared in the rename of IGWC on February 2002 only but the final version done on 12th December 2012. It has been also decided that the Bi-decenery Celebration of the IGWC/AGGS should be celebrated during February 2022 at JNU, New Delhi as **a special event under the guidance of** Prof. A. L. Ramanathan, President of AGGS.

SCOPES

- Identifying groundwater problems in India & implement appropriate measures to control or mitigate them.
- Groundwater professionals in India and neighboring SARC countries believe that sharing knowledge and experience on groundwater matters on a worldwide scale is an effective strategy to identify and promote optimal approaches to the assessment, development and management of groundwater resources.
- This is what the Association of Global Groundwater Scientists (AGGS) intends to do by organizing Seminars/Symposia at various centers in India & Neighboring Countries viz. Bangladesh, Sri Lanka, Pakistan, Nepal & Bhutan, and publishing Proceeding Volumes and new findings among Congress Members.
- The idea on the formulation of this Congress was crystallized by Groundwater Scientists and engineers who attended the last seven International Groundwater Conferences (IGWC). These were organized at Dindigul, Tamil Nadu (2002), JNU, New Delhi (2006), WTC, TNAU, Coimbatore (2007), Madurai (2011), Maulana Azad College of Sci & Tech, Aurangabad (2012), SRM University (Private University), Chennai (2016), New Delhi (2017) and IIT Roorkee (2019).
- As well as attended the last three Indian National Groundwater Conferences (INGWC) organized at JNTU, Hyderabad (2016), Jaitha College, Jalgaon, Maharashtra (2018) and recent one will be organized at CWRDM, Kozhikode (2020). Apart of these, two brainstorming sessions were organized at Chennai, Tamil Nadu (2016) &Dindigul, Tamil Nadu (2017).

VISION

Objectives

- The AGGS will contribute in the field of effective management of groundwater resources.
- In this forum, The groundwater expertise should be used for the effective management and ensuring sustainable development and livelihood in the overstressed areas of the country and elsewhere.
- The AGGS is also committed to work on the promotion of research for minimizing groundwater pollution and to advocate the effective use of groundwater for better health and sustainable livelihood through undertaking appropriate measures.

What the Forum can do

- The AGGS will contribute to information, training and research and will lead to an increased capacity of developing countries in the area of hydrogeology/ hydraulics and water resources management.
- The AGGS will mainly focus in organizing annual events at various centers in India and neighboring countries by bringing AGGS members and other International experts to discuss the latest development in the assessment and management of groundwater resources.
- It also plans to have some research activities in collaboration with National Institutes and International agencies.

Major Tasks & Activities

- The AGGS is envisaged as a functional network and collaboration of different organizations including Govt. Dept., IIT's, National Inst. /Lab., Univ., Water related Industries and NGOs for better sharing and collaboration on emerging issues in ground water management.
- AGGS will plan to bring experts in various fields to a common platform for exchange of new ideas, views and knowledge on a global platform that stimulates initiatives for the advancement of sustainable development and management of groundwater resources.

Focus Various Activities

- Organizing regular annual events for groundwater scientists from all over the globe to assemble and discussing the various new research developments elsewhere and how to solve groundwater quantity and quality problems pertaining to SAARC countries.
- Organization of mass awareness meeting among school children and rural woman folk regarding the quality and scarcity of drinking water and how to create sustainable supply.
- Imparting the scientific knowledge among school children, women and farmers about the identification of potential boreholes in hard rock and drought prone region.
- Identification and development of innovative ideas for conservation of rainwater (rain water harvesting) and rain-fed forests.
- Sustainable development of a watershed in a hard rock region.
- Discussing problems and questions posed by farmers, the politicians, and technical cooperation agencies, general public and potential industrial clients.

Long-Term Goals

- Providing training to young groundwater scientists/ engineers on Mathematical modeling to assess groundwater potential and pollution migration and thereby evolving optimal management schemes.
- Collaborating with public sector; water related institutions, municipalities, non-governmental organizations (NGO) and the private sector for the implementation of water management schemes.
- Promoting projects that directly involve and benefit local communities.

- Initiating and sustaining the activities in the area of community-based research and the social, legal and economic aspects of groundwater resources management.
- Promoting Joint research projects among scientists/ engineers from India and its neighboring countries with leading research institution in the assessment and management of groundwater resources and pollution.
- Development of new methodology to characterize the fracture aquifer geometry and understanding the flow dynamics of fracture system.
- Development and management of coastal aquifer system.
- Promoting the research development of viable and feasible technology for the treatment of contaminated aquifer system.
- Publication of bi-annually quality Groundwater journal (Journal of Groundwater Research (JGWR)) in collaboration with likeminded International professional bodies viz. IAH, IAHS & ISGSD and GEOFORUM of Maharashtra.

AGGS Past Events

AGGS Past EventsBroadly the AGGS had been conducted seven international groundwater conferences, two Indian National Groundwater Conferences as well two brain storming sessions since 2002. Their outcomes are herewith.

IGWC Events Period 2002-2019:

IGWC	Year	Place	Convener
I	2002	Dindigul, Tamil Nadu	Dr. M.Thangarajan
II	2006	JNU, New Delhi	Prof. A.L. Ramanathan
III	2007	WTC, TNAU, Coimbatore	Dr. K. Palanisami
IV	2011	Madurai	Dr. P.S. Navaraj
V	2012	Maulana Azad College of Sci & Tech, Aurangabad	Dr. P.S. Kulakarni
VI	2016	SRM University (Private University), Chennai	Dr. R. Annadurai
VII	2017	New Delhi	Dr.Anupama Sharma/ Dr. N. C. Ghosh
VIII	2019	IIT Roorkee	Dr. Brijesh Kr. Yadav

First IGC-2002 at Dindigul
(Convener: Dr. M. Thangarajan)

Worldwide rapid growth of population, industries and agriculture activities brought about a steep increase in water demands which have to be met from available surface and groundwater resources. Many parts of the world have diverse hydrogeological and hydro meteorological conditions and so is the diversification in its hydrological problems which are mostly governed by the regional conditions. Vagaries of monsoon and withdrawal of groundwater in excess to replenishment of aquifer system in many parts of India and elsewhere results into continuous declining of water table causing economic problems and deterioration of water quality. The problem is manifold in hard rock regions where the water table has gone below the weathered zone and it could be extracted only from deeper fractured zones. The aquifer systems in many hard rock areas have been over exploited. At many places many farmers have drilled bore wells without knowing the potential of aquifer system and the by end up with debt trap due to failure of the bore wells. Therefore, the proper assessment, development and management of groundwater resources to overcome, or at least minimize such problems, a necessity was felt for suitable interaction among researchers, practicing hydrologists, planners and water uses. For this purpose, it was decided to organize an International Groundwater Conference (IGC-2002) on "Sustainable Development and Management of Groundwater Resources in Semiarid Region with Special Reference to Hard Rocks" at Dindigul, Tamil Nadu. This rural town was chosen as the venue of the Conference because it is suffering from scarcity of water supply due to declining of water table and groundwater pollution due to disposal of untreated effluent from farmers and other industries. More than 180 abstracts and 130 full length papers were received. Both abstract volume and one volume of pre-conference proceedings were brought out.



The mission of this Conference was "Let us all join together and find a way to select wells in a more scientific way, arrest the rainfall run off and allow it to go in to groundwater system, remediate the contaminated groundwater with simple technology, use modeling techniques to understand the groundwater dynamics and its response for various input/output stresses, create awareness among farming community to share the limited resource among themselves and preserve static reserve for future generations. Wherein about 50 progressive farmers including a few water diviners through the Revenue Department and NGO were invited. An interactive session between the farmers and Scientists (26 foreign scientists participated) on the last day of the Technical session was arranged. It was really wonderful session which lasted for about 3.5 hours with translation from English to Tamil and vice versa. The farmers were invited for inaugural function which was inaugurated by Sri. Venkaya Naidu Garu who was the Cabinet Minister for Rural

Development during late Prime Minister Vajpayee 's regime. He was very astonished and showered happiness on seeing the farmers in the scientific conference. It was one of the best conference ever organized by IGWC alias AGGS with the support of Local.

Third IGWC-2007 at Coimbatore (Convener: Dr. K. Palanisami)

The 3rd IGC-2007) on Water, Environment and Agriculture Present Problems and Future Challenges (Feb. 7-10, 2007) was organized by Tamil Nadu Agricultural University, Coimbatore, India. The themes for the IGC-2007 were as below.

Water Resources Assessment

- The role of Geographic Information System (GIS) and Remote Sensing Techniques in groundwater resource assessment.
- Recent advancements in Geophysical/Geological/Geo-Engineering techniques in terms of methodology, sensor, signal to noise ratio (measurement accuracy) and interpretation techniques for exploration, exploitation of groundwater resources and assessment of groundwater pollution.
- New techniques on monitoring levels of groundwater and pollution, watershed development, parameterization, assessment and management of groundwater resources in hard and soft rock aquifer system.
- Geo-Statistical technique in estimation of hydrological variables in space and time

Recharge Process and Artificial Recharge

- Application of Isotope techniques in Hydrology
- Recharge process in Arid and Semi-Arid regions
- Artificial recharge methods, including Aquifer Storage and Recovery (ASR) for augmentation of groundwater resources to improve its quantity and quality and impact assessment of artificial recharge on environmental system and management of aquifer recharge.

Water and Environment

- Environmental problems in coastal watersheds (surface and groundwater and contamination interaction) due to human activities.
- The impact of human activities, climate changes and urbanizations on Groundwater system.
- Soil water chemistry and its role in understanding the groundwater pollution.
- Assessment of groundwater pollution and mapping of aquifer vulnerability in porous and hard rock aquifer system and remedial measures in controlling contaminant migration in soils and groundwater system.
- Evolution of Fluoride and Arsenic contamination process in groundwater
- Remediation aspects of groundwater contamination
- Impact of wasteland development on the hydrological cycle due to dwindling of surface water in the lower reach as well as on the sustainability of the already existing groundwater structures.
- Engineering intervention to mitigate contamination migration
- Models and their application in soft and hard rock aquifer system
- Characterization of fracture geometry and its properties for understanding the flow mechanism in hard rocks with special reference to multi-scale level parameters (local scale to extended scale through up-scaling procedure) approach.
- Lake and aquifer interaction studies and conjunctive use of surface and groundwater for sustainable development of aquifer system.
- Groundwater Flow and Mass Transport modeling for the assessment and management of groundwater resources and pollution in porous and fractured medium.
- Issues related to model calibration and validation when models are used as decision-making tools.
- The role of models, modelers and managers in decisions making process.

Agriculture Stress and Water Management

- Quantification of Water Demand and Its Challenges
- The impact of inter-basin water transfer and inter linking rivers on groundwater regime with special reference to ecology and environment
- Drip Irrigation and Fertigation techniques to reduce the stress on groundwater abstraction
- Cropping pattern to reduce the groundwater abstraction stress
- The impact assessment due to high tides like Tsunami waves on groundwater environment and the disaster management aspects
- Management of groundwater resources through scientific and community participation approach with special reference to over exploited regions in developing countries
- The role of Non-Government Organizations (NGO's) and Sociologists in creating awareness among user community on the sustainable development and management of groundwater resources

Groundwater Management Policies

- The economic aspects of water in relation to Agricultural products
- Water Pricing and its problems
- Issues related to legislation of groundwater abstraction
- Sustainable development of water resources
- Demonstration of Successful Case Studies in and outside India

Fourth IGWC-2011 at Madurai (Convener: Dr. P.S. Navaraj)

The Fourth International Ground Water Conference held at Yadava College during 27th to 30th Sept. 2011 was

organized by PG Research Centre Department of Geology, Madurai in collaboration with International Groundwater Congress (India) and Water Technology Centre (TNAU), Coimbatore. This event was sponsored by Department of Science and Technology, Department of Atomic Energy, Mumbai, Ministry of Earth Science, NABARD, CSIR, INSA, NGRI, TNSCST. Two hundred delegates including twenty foreign delegates (US, Japan, Australia, Moroak, Bangladesh, and France) attended and presented papers on themes such as Water Resource management, Application of RS & GIS in water Resource Assessment, Recharge Process and Artificial Recharge Mechanism, Groundwater modelling in the assessment and management of groundwater resources, Groundwater pollution assessment and management, Groundwater management issues/ option and policies. Shri C.J. Samathanam, DST Advisor, in his inaugural address said that fresh water constitutes only 2.5%of the water available in the world in the form of ice as well as water sources above and below the ground. The major share on the fresh water is used for food production. Samathanam complimented the State Government of Tamil Nadu for making rain-water harvesting mandatory for building plan approval. It is the need to create awareness about global warming and groundwater conservation.

In the keynote address Dr. S.N. Ramasamy, Vice Chancellor, Gandhigram Rural Deemed University, pointed out the occurrence of heading through ice melting due to climatically changes. In another ten to fifteen years, the globe may get pooled. People are not compensating the extraction of water source from the ground. The dryness of the land leads to water leakage, drought, developing a high pressure in the land plate as well as sucking of water by the plants has been identified. C. Mayilsamy, Secretary for the Scientific Session explained about the various sessions being conducted in the conference. K.P. Naveneetha Krishnan, Secretary and correspondent of the College said that the conference was organised as a part of its social obligation and to involve the general public in groundwater conservation. An abstract volume was released at the meeting.

The impact of Climate change on groundwater resource was deliberated with special reference to hard rock terrain, Significant role of remote sensing in groundwater management, the success story of artificial recharge, the use of current technology in water management and impact of urbanisation and water sources are the topics that were discussed in length and breadth. Twenty-five progressive farmers and twenty-five school children were invited to discuss with the experts of water management.

Prof. V. P. Singh from Texas University, US spoke on the future challenges in assessment and management of water resources in the monsoon climatic countries like India due to climatic variance. Dr. Singh analyzed comparatively the management techniques being taken up both in the developed and developing countries. The strengthening of weather forecasting, the introduction of highly sophisticated software's and installation of decision supporting tools, management of natural hazards are the areas where India should concentrate. He told the future challenges like improper rainfall pattern, fluctuating wind level, uncontrolled industrial exploitation, excess usage of agriculture chemicals, conversion of water bodies in to land sites ought to be streamlined.

Dr. Noaaki Shibasaki, Professor, Fukushima University, Japan presented an interesting paper on 3D-groundwater simulation model. He evaluated sustainability of Akaki well field near Addis Abaka, Ethiopia.

An interesting interactive session of scientists with a group of students was organized. The students raised inquisitive questions like how to stop the ration queue in getting water in future, whether Acacia is a boon or bane in terms of water management, how to effectively communicate water resource among public, how youngsters can enter into groundwater management field, whether water business has any environmental ethics. The progressive farmers and self-help women groups had a similar interaction. Farmers enquired about toxic free pesticides, low cost methodology to recharge the aquifer, drought resistance plant, less water stressed crops, water calculators. Scientists were pleased to answer all the queries.

Fifth IGWC-2012 at Aurangabad (Convener: Dr. P.S. Kulkarni)



Fifth International Ground Water Conference (IGWC-2012) on "The Assessment and Management of Groundwater Resources in Hard Rock systems with special reference to Basaltic terrain" had been planned under the leader ship of Prof. P.S. Kulkarni during December 18-21, 2012 at Maulana Azad College of Arts, Science & Commerce, Aurangabad, Maharashtra, India. The main emphasis in organizing such an International Ground Water Conference was that the outcome of deliberations of the conference could reach the users, who are facing the problems due to groundwater shortage and quality deterioration. Taking in view of the present trend in groundwater activities and problems, the following themes had been discussed in the conference.

- Resources Assessment and Aquifer characterization
- Recharge Estimation process and Augmentation

- Agriculture stress and water management
- Water and Environment
- Models and its application in groundwater management
- Management Aspects

The convener had received ~420 abstracts both from India and abroad under the above mentioned themes. Papers had been classified as keynote papers and invited papers. There was about 40 foreign delegates representing from various countries and interacted with about 300 Indian scientists, NGOs and farmers. An interactive session between young groundwater scientists and senior scientists on the approaches to be followed for the characterization and modeling of fractured aquifer was also done on 21st December, 2012.

The main mission of this conference was that let us all joined together to find a more innovative way of selecting high yielding wells in crystalline and basaltic terrain, assess the reliable recharge potential through various methods, augment the groundwater system through artificial recharge method, remediate the contaminated groundwater system with simple technology, apply various modeling technique for the assessment and management of water resources and create awareness among rural folks to use the limited dynamic resource optimally and reserve the static reserve for future generation. All the above were essential pre-requisite for the effective assessment and management of groundwater resources.

Sixth IGWC-2015/2016 at Chennai (Convener: Prof. R. Annadurai)

Taking in view of the glorious period of the IGC, the sixth International Ground Water Conference (IGWC-2015) was planned during December 09-11, 2015 at SRM University, Chennai, India. The Conference was aimed to bring Scientists, Researchers, Students, Engineers, Water Resources Specialists, Government Administrators, NGOs and all those interested in groundwater and environment problems to a common platform and offer the opportunity to exchange ideas, knowledge, experience, techniques and know how in various aspects of groundwater research carried out in the last few decades in India and elsewhere.

The conference had received more than 300 abstracts on the above themes. Papers had been classified as oral and poster presentation as well invited papers had been received as Keynote presentation. About 160 full length manuscripts including keynote papers were received and planned to bring out both abstract volumes and pre-conference proceeding volume through CD. The planned conference during December 09-11, 2015 could not take place due to very heavy rain at Chennai and it was rescheduled to February 11-13, 2016. The reschedule had hampered both foreign delegates and Indian delegates very much and it was not expected participants to the conference yet it went on well with so many constraints.

Seventh IGWC-2017 at New Delhi (Convener: Dr. N. C. Ghosh)

The 7th International Ground Water Conference-2017(IGWC-2017) focusing on "Groundwater Vision 2030: Water Security, Challenges and Climate Change Adaptation" was organized jointly by the National Institute of Hydrology (NIH), Roorkee and Central Ground Water Board (CGWB), Faridabad in association with "Association of Global Groundwater Scientists (AGGS), India, and "Texas A&M University, USA" under the aegis of the "National Hydrology Project" of Ministry of Water Resources, River Development & Ganga Rejuvenation, Government of India. The IGWC-2017 was organized from 11th to 13th December, 2017 at ICAR-NASC complex, Pusa, in New Delhi with an add-on activity on 14th December, 2017, as a post-conference workshop.

The aim of IGWC-2017 was to provide a common platform for policy planners, researchers, academicians, water managers, professionals, industrialists, technocrats, and young researchers and aspirants to discuss and present their views and vision on emerging issues related to groundwater management in the face of growing challenges arising from the rising population and consequent growing demands as well as anticipated impacts of global warming and climate change.

Technical deliberations during the Conference took place based on 39 select keynote papers and about 220 volunteered papers received from India and abroad on the above 10 themes. Besides keynotes and regular scientific paper presentations on all three days, the Conference had three important add-on activities, viz., International Association of Hydrogeologists (IAH) session on "Managed Aquifer Recharge," Indian National Committee on International Hydrology Program (INC-IHP) brainstorming session on "Groundwater in a Changing Environment," and Annual General Body Meeting of AGGS.



The Conference had another attractive activity "Business to Business

Exhibition" to showcase hardware and software solutions, technology solutions & demonstration, instruments & products exhibit. On 14th December, 2017, a post-conference workshop on "Groundwater Modelling using iMOD for the Ganga basin" jointly organized by Deltares, The Netherlands, and the National Institute of Hydrology, Roorkee, was another technology promotion and dissemination activity.

Eighth IGWC-2019 at IIT Roorkee (Convener: Dr. Brijesh Kr. Yadav)

Department of Hydrology, IIT Roorkee organized the 8th International Groundwater Conference-2019 (IGWC-2019) during October 21-24, 2019 with focus on 'Sustainable Management of Soil and Water Resources'. The joint organizers for the conference were the Association of Global Groundwater Scientists (AGGS) and the Indian chapter of International Society for Porous Media (InterPore). The inaugural function of this conference took place on October 22, 2019 in Auditorium of Multi Activity Center (MAC). Prof. A. K. Chaturvedi, Director, IIT Roorkee presided over the inaugural function. During the forenoon session of October 22nd, plenary talks were held at the MAC followed by 18 technical sessions and a poster session during Oct 22-24 at Department of Hydrology, IIT Roorkee. The sessions were held on important and intriguing topics such as soil-water pollution, Isotope Hydrology, remediation of contaminated soil water, rain water harvesting etc. which spanned over from 22nd to 24th October, 2019.A brain-storming session on 'National Aquifer Mapping Programme' was organized on October 23 in parallel to a special technical session on 'Managed Aquifer Recharge' coordinated by Prof. Shakeel Ahmad and Dr. Peter Dillon, respectively.

More than 300 participants from India and abroad attended this mega event which was focused on 'Sustainable Management of Soil and Water Resources'. Delegates from 17 countries representing Australia, Bangladesh, Canada, China, Cuba, Ethiopia, France, Germany, Iran, Italy, Sweden, Sri Lanka, Thailand, UK, and India attended the conference.



INGW Events Period 2016-2019:

INGWC	Year	Place	Convener
I	2016	JNTU, Hyderabad	Dr. B. Venkateswara Rao
II	2018	Jalgaon, Maharashtra	Dr. Uday Kulkarni

First Indian National Groundwater Conference (INGWC-2016) at Hyderabad (Convener: Prof. B. Venkateswara Rao)

The First Indian National Groundwater Conference (INGWC-2016) on 'Sustainable Development and Management of Groundwater Resources in Arid and Semi-Arid Regions' was held during October 5-7, 2016 at the auditorium of UGC-Human Resource Development Centre, JNT University Hyderabad. The conference was jointly organized by Centre for Water Resources, Institute of Science and Technology (IST) and Association of Global Groundwater Scientists (AGGS). More than 150 delegates had attended the conference from almost all parts of the country and few participants from abroad including Australia, Iran, Japan and USA. There were three plenary sessions and eight technical sessions apart from inaugural, panel discussion and valedictory sessions. Altogether, there were 12 keynote speakers and more than 75 technical presentations were made.

The state of the art equipment



on groundwater exploration and groundwater quality apart from latest literature on the groundwater from the two publishers was displayed at the exhibition. The conference was attended by Scientists, Engineers, Teachers, Scholars, Students, govt. officials and NGOs from various organizations like IIT, NIT, NIH, NGRI, NRSC, State and Central Universities, CGWB, State groundwater departments, panchayat raj departments and other NGOs.

Second Indian National Groundwater Conference (INGWC-2018) at Jalgaon (Convener: Prof. Uday Kulkarni)

It had been observed a phenomenal number of wells going dry resulted in supplying of even the drinking water by a train or lorry in the rain shadow regions of Marathwada. This unprecedented setback caused two consecutive drought years and uncontrolled enormous usage of groundwater over the last three to four decades. But at the same time the draft is more than annual recharge putting the sustainability of these wells at stake. Thus AGGS conducted the 2nd INGWC-2018 at Jalgaon, Maharashtra during December 20-21, 2018.

Nearly 75 delegates including scientists, engineers, academicians, policy makers, NGOs and industry representatives who directly deal with groundwater usage covering different segments of the country attended the Second Indian National Groundwater Conference (INGWC-2018) that focused on an important theme: 'Water conservation for sustainable and regenerative model for future'. This conference was organized during Dec.20-21, 2018 at Jalgaon byK.C.E. Society's of MooljiJaitha College, Jalgaon in collaboration with School of Environmental and Earth Sciences, North Maharashtra University, Jalgaon; GEOFORUM (Maharashtra) and Association of Global Groundwater Scientists (AGGS), India. The following are the recommendations of the two days' conference.



The session concluded with a remark on the future thrust areas of research in India such as

- Aquifer mapping
- Community based management
- Recharge area and source link/ usage area
- Research and enactment to solve common man problem
- Developing a mobile app (What's app) for water
- Micro irrigation
- Economics of water
- Re exploring watershed management studies.

Second Brain Storming Session (BSS-2017) at Dindigul (Convener: Mr. Paul Basker)

The Association of Global Groundwater Scientists (AGGS) in collaboration with Peace Trust, Dindigul (NGO), RVS College of Engineering & Technology, Dindigul, SSMIET, Dindigul organized a brain storming session on Understanding water systems under variable climatic and scarcity conditions in hard rock regions with special reference to frequent drought areas as well mechanism to control the disaster arising out of the extreme droughts and flood events" at Dindigul on 5th August, 2017. It was organized by Dr. M. Thangarajan, Founder, AGGS, Dr. C. Mayilswami, Secretary, AGGS, & Dr. J. Paul Baskar, Chairman, Peace Trust in collaboration with Mr. D. SenthiKumar, Principal, RVS College of Engineering and Technology, Dr. M. Saravanan, Principal, SSMIET and Mr. Manivannan, Principal, ABC Polytechnic College.

About seven experts who were working on groundwater exploration, assessment and management are contributing papers and 5 presenting their studies on the above aspect (see list of abstracts as below). The scientists had interacted with invited 150 progressive farmers and seven farmer leaders on groundwater exploration and management. The abstract volume is the outcomes of the papers presented by the authors and was released by Mr. P. Velu, District Revenue Officer, Dindigul.

Brain Storming Sessions (at Chennai & Dindigul):

Brain storming session	Year	Place	Convener
I	2015	Chennai, Tamil Nadu	Prof. L. Elango
II	2017	Dindigul, Tamil Nadu	Mr. Paul Basker

First Brain Storming Session (BSS-2015) at Chennai (Convener: Prof. L. Elango)

First Brain Storming Session on Groundwater Resources Management was held on 18.04.2015 at Institute of Ocean Management (IOM), Anna University, Guindy, Chennai. Dr. Hema Achyuthan, Prof. & Head, Department of Geology, Anna University delivered the welcome address followed by the presidential address by Dr. M. Thangarajan, Founder President & Member and Retired Director Grade Scientist, NGRI, Hyderabad. Emeritus Professor Dr. R. Sakthivadivel, Centre for Water Resources, Anna Universityhas inaugurated and chaired the brain storming session along with Dr. M. Thangarajan and Dr. B. Venkateswara Rao. Groundwater scientists from various government organizations, nearly 20 research scholars and 40 post graduate students were also actively interacted and participated.

Upcoming Events

- The III-INGWC 2020, CWRDM, Calicut, Kerala
- The XI- IGWC-2021, JNTU, Hyderabad, Telangana



IGCs over the Years: a perspective of an Australian Participant

Dr. Peter Dillon CSIRO,
National Center for Groundwater Research and Training, Australia

I have had the good fortune to attend 4 IGCs over the years including the first in Dindigul and subsequently in Aurangabad, New Delhi and Roorkee. My most vivid memories are of the Dindigul conference in 2002 where for one afternoon conference attendees sat with local farmers in a village square to hear their personal concerns about groundwater – well yields declining and running dry, pumps needing to be lowered, wells being deepened and groundwater salinity increasing. Fortunately, Dr.M.Thangarajan had provided for translation that led to a revealing exchange of information from farmer and hydrogeologist perspectives. Dr. Chris Barber also of Australia was present.

The farmers were astute. They understood that a good monsoon meant that there was more water in their hard rock aquifer. They had also observed depletion affected by more farmers installing pumps following establishment of electricity supply. Before that they had only diesel pumps and these were used frugally because of the cost of fuel. The scientists responded to help explain the reasons for the observed impacts on groundwater. Their concept of an aquifer differed from farmers who viewed groundwater as what came out of their own well. The notion of a shared resource was clear to hydrogeologists, but farmers were unsure whether their groundwater was linked to groundwater pumped by other farmers. This had implications for acceptance by farmers of management strategies. There was considerable debate on this without resolution. It was clear that monitoring of groundwater levels and impacts of pumping wells could have a profound impact on the understanding by farmers and provide a foundation for groundwater management. There was agreement that avoiding pollution of groundwater was important for it to remain suitable for drinking and irrigation.

The meeting was novel and gave hydrogeologists an appreciation that not everyone thinks about aquifers as we do, and there is some work ahead of us in communicating widely with groundwater users to impart a more factual basis for understanding aquifers and how to improve groundwater management. Face to face meetings are vital to ensure that we understand farmers' concerns and to enable them to gain a clear grasp on how groundwater systems work, making use of existing local data.

AGGS Committee

Executive Committee-2019-22:

The election was conducted by Prof. D.C. Singhal as the Election officer. On the basis of the voting results, the newly elected executive office bearers is as under **(Declaration of Elected Office Bearers of AGGS for the Term 2019-22, Dated: Feb. 12, 2019):**

President	**Prof. A.L. Ramanathan**	**Professor, Jawaharlal Nehru University New Delhi**
Vice President	**Dr. P. S. Kulkarni**	**Professor, Maulana Azad college of arts, science and commerce, Aurangabad, MS**
Secretary	**Prof. C. Mayilswami**	**Retired Professor (SWCE), WTC, TNAU, Coimbatore**
Joint Secretary (India)	**Dr. N.C. Mondal**	**Senior Scientist, CSIR-National Geophysical Research Institute, Hyderabad**
Joint Secretary (Foreign)	**Dr. Moumtaz Razack**	**Professor, University of Poitiers Rue Albert Turpain France**
Treasure	**Dr. A. Valliammai**	**Assistant Professor (SWCE), WTC,TNAU, Coimbatore**

Felicitation of Senior Most Distinguished Scientists/Researchers in Groundwater was done during IGWC-2019, IIT Roorkee

AGGS Distinguished Fellow



Dr. M. Thangarajan
Retired Scientist-G,
NGRI, Hyderabad



Professor Vijay P. Singh,
Dept. of Civil & Environmental Engg.,
Texas A&M University,
College Station, Texas

AGGS Fellow



Prof. B. Venkateswara
Director,
Jawaharlal Nehru Technological University, Hyderabad



Prof. C. Mayilswami
Former Professor in Soil and Water Conservation Engineering (SWCE) and Former Chief Scientist for ICAR



Prof. D.C. Singhal,
Former Professor at Department of Hydrology, IIT Roorkee



Prof. L. Elango,
Professor,
Department of Geology, Anna University, Chennai



Prof. Naoaki Shibasaki,
Professor,
Faculty of Symbiotic Systems Science, Fukushima University, Japan



Prof. P. S. Kulkarni
Former, Professor & Head Department of Geology Maulana Azad College, Aurangabad



Prof. Vasudevan Subramanyan
Senior Principal Scientist of CSIR-Central Electrochemcial Research Institute, Karaikudi



Dr. Shivendra Nath Rai,
Former Chief Scientist CSIR- Nation Geophysical Research Institute, Hyderabad

About the Journal of Groundwater Research (JGWR) http://aggs.in/index.html

Journal of Groundwater Research (JGWR) is an International peer reviewed journal published by AGGS alias International Groundwater Congress (IGWC), India. The Editorial Board includes prominent researchers, scientists, academicians, and professionals workingin the field of Groundwater and allied areas from all around the world. The first issue of JGWR was released on 18thDecember, 2012, on the eve of the 10thAnniversary of IGWC at Aurangabad during the IGWC-2012 conference. AGGS is a leading non-governmental professional organization in India serving the scientific community for more than 10 years and it has been gradually growing and scaling new heights. Under its auspices, a series of conferences have been organized in various parts of the country. The peer-reviewed journal is another milestone that AGGS has achieved. JGWR, will provide a platform for publication of state-of-the -art research findings of groundwater scientists, hydrologists, geologists, hydro-geologists, geophysicists, engineers, environmental scientists, agricultural scientists, policy makers, economists, and so on from India and abroad. Prof. Vijay P. Singh, Texas A&M University, Texas, USA, is Editor-in-Chief and Prof. Mritunjay Kumar Singh, IIT(ISM), Dhanbad, is Deputy Editor-in-Chief of JGWR. We invite original research articles for consideration of publication in JGWR. The forthcoming volume of the journal is Vol.8.



Editor-in-Chief:
Professor Vijay P. Singh

Deputy Editor-in-Chief:
Professor Mritunjay Kumar Singh

Membership Form

1. Name of the Applicant (in block letters) : ..... (Surname) (First name) (Middle name)
2. Designation or Position : .....
3. Name & Address of the Employer : .....
4. Address for AGGS Mail : .....

.....

.....

.....

Telephone No. (Office) : .....

(Res) : .....

Email : .....

5. Date of Birth : ..... Nationality: .....
6. Qualification : .....

(a) Academic Qualifications : .....

(b) Technical Training : .....

7. Membership in other societies : .....
8. Professional Experience : .....

(a) Particulars of past experience, with dates : .....

(b) Nature of present work : .....

(c) Field of interest : .....

(Civil Engineering, Geophysical Sciences and Soil& Water Conservation Engineering etc.)

9. Code of Membership requested : .....
10. Your old membership No. if any : .....
11. Reference with address : .....

(AGGS members preferred) .....

I hereby apply for membership of the Association of Global Groundwater Scientists. I am sending herewith Rs. _____ as admission fee and Rs. _____ as subscription for the year/years/life membership. I testify that the above statements are correct and agree that if admissted. I shall be governed by the Rules and Regulation of the Association of Global Groundwater Scientists as long as I am a member. I further agree to promote the objects of the Society as far be within my power and that, if my membership is discontinued, I shall return any means of membership identification I may have received from the society and remit upon resignation any unpaid fees or dues owing to the Society. I undertake to present to the society original communication every year relating to the profession in Groundwater, I further undertake to abide by professional conduct rules or code of ethics that the society may frame time to time.

Date: Signature of the Applicant

[Note: Kindly see the following Annexure-I for details of the categories of membership and fee structure as well address for communication].

Association of Global Groundwater Scientists (AGGS)

Alais International Groundwater Congress (IGWC) (Registered No.1/2013, Dated: 04.01.2013, Tamil Nadu Societies Registration Act 1975)

Administrative Office: Located at Coimbatore, Tamil Nadu, India

Annexure-I

CATEGORIES OF MEMBERSHIP:

		Subscription		Admission Fee	
		Inland (Rs.)	Foreign ($)	Inland (Rs.)	Foreign ($)
Corporate Member (one-time payment)	Any University/Institution/ Private Firm	20,000	1500	100	30
	Department or Affiliated college	15,000	2000	100	30
	NGO's	10,000	1500	100	30
Life Member	A qualified personnel working in Groundwater fields	5000	200	50	20
Senior citizens	From 60 -70 years	2500	100	50	10
Super Senior citizens	Above 70 years	1000	75	50	10
Member (annual)	A qualified personnel working in the field of groundwater	1000	50	50	10
Affiliate Member (person) (annual)	Any individual or body pursuing the profession of Groundwater will be eligible for Affiliate Membership	1000	50	50	10
Student Member (5 years)	Person undergoing a course of study/training or apprenticeship in Civil Engineering, Geophysical Sciences, Soil & Water Conservation Engineering and Environmental Engineering/Sciences are eligible for Student Membership	1000	50	50	10

N.B:

1) Society's financial year is from 1st April to 31st March. Payment by crossed draft will be preferred and payable to the Association of Global Groundwater Scientists.
2) Graduate engineers can become life member by paying the fees.
3) Please mail the completed form along with remittance to.

The fees should be paid through Cheque/DD drawn in any Nationalized Bank in favor of Secretary, AGGS, Payable at Coimbatore, Tamil Nadu, India and send it to Dr.C.Mayilswami, Secretary, Association of Global Groundwater Scientists, India Site No.40&41, Super garden extension II, Vadavalli, Coimbatore-641 041, Tamil Nadu
E-mail: ceemayil@gmail.com
Mobile: 099524 46416

For online transfer the bank details:
The Secretary, AGGS
State Bank of India
Current A/C Number: 32797387800
IFS Code: SBINOOO5740
SWIFT Code: SBININBB451
MICR Code: 641002012

Address:
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Sarvodaya Sangh Building,
Maruthamalai Main Road,
Coimbatore-641041, Tamil Nadu, India
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