



**ASSOCIATION OF GEOSCIENTISTS FOR**  
**INTERNATIONAL DEVELOPMENT**  
**(AGID)**  
**GEOSCIENCE NEWSLETTER**

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**From Hon. Editor's Desk:**

In 2016, I completed 40 years association with AGID in various capacities, starting from a Councilor in 1976. The year 2016 is also marked by a unique success for my efforts since June 2015, for getting Geohost grant for AGID team of 8 members to attend the 35<sup>th</sup> International Geological Congress in Cape Town. The AGID team comprised me and Afia (AGID President), who were the Theme Champions and 6 more Session Conveners in AGID Theme "Geosciences for benefit of low-income countries". Unlike the previous IGCs, the Geohost grant of this IGC was meant only for the "delegates from low-income countries as per World Bank's list". None of us fitted in to this list. Through various e-mails, I was able to convince the Organizing Committee of the IGC that unless an exception was made to this rule for giving the Geohost grant to AGID Team, there would be no one at the IGC to conduct the sessions under AGID's Theme, which happened to be the only Theme fully devoted to the needs of low-income countries. Our request for special Geohost grant was kindly approved around 8<sup>th</sup> of August,

resulting in a frantic rush to obtain letters of support, visas, get our sponsored air-tickets, confirm our hotel bookings, and pack our suitcases. We, the Team of 7 Members reached Cape Town between 24<sup>th</sup> and 26<sup>th</sup> August. Planning and management of the Geohost grant was so perfect that each one of us was provided transport from and to the beautiful Airport of Cape Town. Moreover, for local expenses each Geohost delegate was given a pre-loaded debit card. At the special breakfast arranged for them on 29<sup>th</sup> August in Marimba restaurant at the Venue, all the Geohost delegates had an opportunity to meet and thank Prof. Jeannette Mc Gill and Dr Albertus Smith, the Directors of Geohost programme.

Our AGID team however, missed two important members. One was Dr Antony Reedman, AGID treasurer from UK, who could not attend due to personal reasons. Second member was Prof. Viqar Husain, AGID Vice-President from Karachi, who had sent an Abstract to the IGC Secretariat but unfortunately it was not registered with them on their Computer system. His name could not therefore be considered for Geohost grant. Even the modern technology sometimes makes big mistakes.

AGID's general assembly (GA) was convened as scheduled, on 30<sup>th</sup> August at 18.00 hours in Room No.2.44 – 2.66 at CTICC (Cape Town International Conference Centre). AGID President, Ms. Afia Akhtar was in the Chair. It was decided to continue AGID so as to have a good exposure and representation at the next IGC (2020) in New Delhi.

Even on the backdrop of global economic downturn, especially in mining sector, the 35<sup>th</sup> IGC was a grand success. Our AGID team was instrumental in founding the "South Asian Association of Women Geoscientists (SAAWG)" on the last day of the Congress. This was done in view of the next IGC in 2020 at New Delhi. As I can't be a Member of SAAWG, they have appointed me as Adviser.

### **AGID wishes its Members and Well-Wishers a HAPPY, ACTIVE and FRUITFUL NEW YEAR 2017**

-Dr Shrikant Daji LIMAYE.

Hon. Editor of the Newsletter & Past President of AGID

## **MEETINGS & CONFERENCES**

### **The 35<sup>th</sup> International Geological Congress (IGC)**

The 35<sup>th</sup> IGC was an overwhelming success going by the sentiments expressed by Prof. Roland Oberhänsli (Past President of IUGS); by the new IUGS team; as well as by many delegates and accompanying persons. This success has been largely due to the commitment and hard work of the Local Organizing Committee (OC) coupled with guidance from the 35 IGC Foundation Board. The OC and the Board formed a wonderful team which was instrumental in staging such a world class event. The invaluable support of IGC sponsors was also a crucial factor in ensuring the success of the 35<sup>th</sup> IGC.

The congress took place against the backdrop of extremely difficult economic times. However, over **4000** delegates and accompanying persons coming from 117 countries attended the Congress. Over **5000** abstracts were submitted for oral and poster sessions. Due to nice cool climate the stay of delegates in the beautiful city of Cape Town was very comfortable. After six

years of planning and hard work the closing of the 35<sup>th</sup> IGC has left behind a number of excellent legacy projects, particularly from an Educational, Geoheritage and Geotourism point of view. These projects will keep many geoscientists world over very busy for some time to come.

The 36<sup>th</sup> IGC in New Delhi will be in 2020 while the 37<sup>th</sup> IGC will be in Busan in S. Korea

## **ENVIRONMENT**

**The race to save Iran's water, before water scarcity dries out entire cities and displaces millions.**



(Figures: (Left) Women carrying water cans over long distance & (Right) Dry bed of a historical tank.)

It is hard to imagine life without access to sufficient quantities of fresh water. However, in some parts of the world, particularly the Middle East, that is becoming more than a theoretically disturbing possibility, as climate change, mass migration, environmental degradation, drought and political instability - among other issues - make the use and management of diminishing water resources an increasing challenge.

It's a particular concern in Iran, where a number of problems - not least the stifling effect of years of international sanctions - mean water depletion is now receiving some serious attention.

As Kaveh Madani, an environmental policy expert at London's Imperial College, explains, there are three main reasons for Iran's rapidly declining water resources, "one being the rapid population growth".

He says: "In less than two decades the population of Iran doubled. The second cause is an inefficient agricultural sector. It's been very important for us over the years of war with Iraq and after that during the sanctions. So it was natural to be really worried about food self-sufficiency and food availability in this country. And the third cause being mismanagement."

"Water is also linked to so many things and unless we understand and appreciate the linkages and this complexity, we cannot solve this crisis," he adds.

And a crisis is exactly what it is becoming, Madani explains: "Rivers and lakes are going dry one after another, we're losing wetlands, we're seeing land subsidence, we're seeing desertification, which is really sad."

But as Iranians watch their beloved bodies of water disappear, their wells dry up and their farmland turn to dust, there is a growing understanding that the country needs to radically rethink its attitude to water use.

The government has begun to introduce programs to conserve and manage water more efficiently - particularly in agriculture - while using social media to alert the public to the problem.

Will these measures prove effective? And do they carry any lessons for other countries in this increasingly arid part of the world?

### **Jet Streams merger warns strange climate**

Climate scientists have expressed alarm after "unprecedented" data showed the Northern Hemisphere atmospheric Jet Stream crossing the Equator. Environmental blogger Robert Scribbler noted that the Northern Hemisphere Jet Stream has merged with the Southern Hemisphere Jet Stream.

"It's the very picture of weather chaos due to climate change. Something that would absolutely not happen in a normal world," he wrote. "Something that if it continues, basically threatens seasonal integrity."

"Like many extreme events resulting from human-forced climate change — this co-mingling of upper level airs from one Hemisphere with another is pretty fracking strange," Scribbler explained. "Historically, the Tropics — which produce the tallest and thickest air mass in the world — have served as a mostly impenetrable barrier to upper level winds moving from one Hemisphere to another. But as the Poles have warmed due to human-forced climate change, the Hemispherical Jet Streams have moved out of the Middle Latitudes more and more."

### **Turmoil in Saudi Arabian water sector as country runs dry**

Half a century ago, Saudi Arabia sat on one of the world's biggest and oldest aquifers, containing an estimated 500 cubic kilometers of water. However, there has been **chronic mismanagement of water resources**. In one generation most of that massive amount of water has been exhausted, mainly through a seriously flawed agricultural policy. The Saudi authorities have tried to lower water use, mounting big publicity campaigns and giving away water-saving devices such as more efficient showerheads. In some areas the campaigns have been successful, but the government is realizing mistakes arising from its overly generous subsidy regime. Once people have grown used to paying virtually nothing for water services, they deeply resent any charges – even if the taps are running dry.

Series of false-colour images showing the evolution of agricultural operations in the Wadi As-Sirhan Basin, as viewed by satellites in 1987, 1991, 2000, and 2012. The images were captured

by similar sensors – the Thematic Mapper and Enhanced Thematic Mapper Plus – on Three



*(Water was once in full abundance in Saudi Arabia!!!)*

Different Landsat Satellites (4, 5, and 7). For scale, the agricultural fields in the images are about one kilometer across and use center-pivot irrigation. (...Continued in next section)

### **What California could learn from Saudi Arabia**

A decade ago, reports began emerging of a strange occurrence in the Saudi Arabian desert. Ancient desert springs were drying up.

The springs fed the lush oases depicted in the Bible and Quran, and as the water disappeared, these verdant gardens of life were returning to sand.

“I remember flowing springs when I was a boy in the Eastern Province. Now all of these have dried up,” the head of the country’s Ministry of Water told The New York Times.

The springs had bubbled up for thousands of years from a massive aquifer system that lay underneath Saudi Arabia. Hydrologists calculated it was one of the world’s largest underground systems, holding as much groundwater as Lake Erie.

So farmers were puzzled as their wells dried, forcing them to drill ever deeper. They soon were drilling a mile down to continue tapping the water reserves that had transformed barren desert into rich irrigated fields, making Saudi Arabia the world’s sixth-largest exporter of wheat.



(From 1987 to 2000: Tremendous growth of wheat irrigation. (Credit: NASA).)

By the 1990s, farmers were pumping an average of 5 trillion gallons a year. At that rate, it would take just 25 years to completely drain Lake Erie. But the bounty didn't last. Today, Saudi Arabia's agriculture is collapsing. It's almost out of water. The Government has declared that it is no longer in wheat growing business. The underlying cause doesn't bode well for farmers in places like California's Central Valley, where desert lands are irrigated with groundwater that is increasingly in short supply. United States, China and the rest of the world can learn a lot from Saudi Arabia.

### **China's Threatened Aquifers Feeding its 10% Population**

The aquifer system in northwest China has been experiencing ominous signs like Saudi Arabia did a decade ago. Wells are going dry and water tables are dropping fast. The Earth Policy Institute estimates China is feeding 130 million people, about a tenth of its total population, by over-pumping and depleting its sinking aquifers. When the aquifer system runs out, analysts say, China will need to rely on produce from foreign farmlands to feed 130 million people. They will be competing with the 30 million Saudis already relying on imported food.

A global domino effect has begun. As one country runs low on water, it turns to another, putting more strain on its water reserves. Last year, both China and Saudi Arabia set record-high agricultural imports from the United States. Almarai, one of Saudi Arabia's two main dairy producers, purchased 15 square miles of farmland in the Arizona desert to grow alfalfa for export back to the country. Alfalfa is so water intensive that it requires three to four times more irrigation than wheat. That water comes from the Colorado River, where reservoirs are at an all-time low, threatening the drinking water for Las Vegas, Los Angeles and San Diego.

In 2013, with the financial and political backing of China's government, a Chinese company purchased America's largest pork producer, Smithfield Foods, securing 1 in 4 American-raised pigs, plus the water-hungry grains those 30 million pigs consumed. It was the largest-ever Chinese acquisition of an American company. By buying food from America, China is in effect importing virtual water in the form of corn, soy, nuts and meats.

The United States has no national plan to monitor the effect these virtual water exports are having on its aquifers. The Saudis did the same thing. And it cost them dearly. California is now threatening restaurants with a \$500 fine if they serve drinking water to customers – unless a customer requests the water. But the entire state – all 38 million people – drink only about one-tenth of 1 percent of the state's annual water use. In comparison, farmers, who face no water restrictions, use about 7 percent of its annual water to grow almonds for export overseas.

*If there is a lesson emerging, it is this: Wells may become short lived but mismanagement flows eternally.*

### **Why Trees won't save us from Climate Change?**

Trees can slow the warming of our planet by taking carbon out of the air, but only if they're healthy. However, hotter and longer summers could soon be weakening trees beyond repair, devastating whole forests across North America and turning them into sources of carbon, in some cases as soon as 2050.

“It’s like a thermostat gone badly.” said Margaret Evans, an assistant research professor in the University of Arizona’s Laboratory of Tree-Ring Research and a lead author on the study. “Forests act as a carbon sink by taking carbon dioxide out of atmosphere, but the more the climate is warming, the slower the trees are growing, the less carbon they suck up, the faster the climate is changing.”

Evans and her colleagues used more than 2 million historical tree-ring records from across North America, a metric used to understand how much a tree grew in any given year, which they then cross-referenced with annual climate conditions that year to make projections about how the planet’s future climate would correspond to tree growth in coming years.

It turns out that while warmer temperatures can be good for tree growth in the short term, there is a tipping point beyond which more heat is detrimental. In the southwestern United States, as well as the interior of Canada and Alaska, for example, forests could see up to a 75 percent slower growth rate due to higher summer temperatures, according to the researchers. Eventually, the heat will stress trees to their breaking point.

## **Five Ways by which Smart Agriculture Turns Less Water into More Food**



Food security and water security are two sides of the same coin: how are we going to feed and hydrate the world’s growing population in the face of greater and greater water scarcity? Climate change — for which we are indirectly responsible, and mismanagement of water resources — for which we are directly responsible, are threatening our ability to sustain ourselves on this beautiful planet of ours. The scary statistics are well known. But perhaps the silver lining in this cloud is that the necessity and urgency are inspiring a great deal of inventiveness in agriculture. The following are five strategies are aiming to raise the IQ of agriculture practices, so that we can grow more food with less water:

1. Promoting hi-tech agriculture concomitant with climatic pattern.
2. Making re-use of waste water.
3. Developing crop varieties which are more resilient to drought and heat.
4. Increasing irrigation efficiency
5. Promoting Urban Agriculture, including Aquaponics. (Innovative merger of fish farming and hydroponics.)

## **NEW BOOKS**

On 16 December 2016, the book “Planet Earth – An Unfinished Story” (publisher: Il Mulino 2016), written by Carlo Doglioni (President of the INGV – Italian Institute of Geophysics and Volcanology) and [Silvia Peppoloni](#) (IAPG – Secretary General) got the third place in the grand final of the Italian Award for Science Dissemination, category “Mathematic...al, Physical and

Natural Sciences”.

This book covers a wide range of geological issues and a section is dedicated to Geoethics. About 400 Italian authors with more than 200 books and 250 articles applied for the 2016 Award. Congratulations to Silvia and Carlo for this important result! More information about this book: <https://www.mulino.it/foreignrights/isbn/9788815263766>

## **COMING EVENTS**

### **6 - 8 March 2017**

ISPRS. JURSE 2017, Joint Urban Remote Sensing Event, URBAN 2017, 10<sup>th</sup> International Symposium Remote Sensing and Data Fusion over Urban Areas, URS 2017, 12<sup>th</sup> International Symposium Remote Sensing of Urban Areas. Dubai, UAE. *Website:* <http://jurse2017.com/>

### **12 - 15 March 2017**

Geotechnical Frontiers 2017. Orlando, Florida, *Website:* <http://geosyntheticsconference.com>

### **13 - 17 March 2017**

[Joint International Meeting](#), Geological Society of America and Geological Society of Africa, *Geological Evolution of Africa—Making and Breaking of a Continent*. African Union Commission Conference Centre, Addis Ababa, Ethiopia  
*Website:* <http://community.geosociety.org/africa2017/home>

### **26 - 31 March 2017**

MineWat2017 – 2nd International Multidisciplinary Conference on Mineral Waters: Genesis, Exploitation, Protection and Valorisation. Vila de Lusa, Portugal.  
*Website:* <http://www.minwatportugal2017.org/>

### **5 - 9 April 2017**

[The American Association of Geographers \(AAG\) 2017 Annual Meeting](#), Boston, Massachusetts, USA *Website:* <http://www.aag.org/>

### **29 May - 1 June 2017**

LuWQ2017 – International conference on LAND USE and WATER QUALITY. The Hague, The Netherlands, *Website:* <http://www.luwq2017.nl/>

### **29 May - 2 June 2017**

4th World Landslide Forum. International Consortium on Landslides. Ljubljana, Slovenia.  
*Website:* <http://www.wlf4.org/>

### **11 - 13 July 2017**

Australasian Groundwater Conference 2017. Sydney, Australia,  
*Contact:* [w.timms@unsw.edu.au](mailto:w.timms@unsw.edu.au)

**More Coming events available from:** <http://iugs.org/index.php?page=calendar>.