



BRICS Young  
Scientist Forum

# THE BRICS REPORT

BRICS 3rd Young Scientist Conclave

Durban, South Africa  
(25-29 June 2018)

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## **Report on the 3<sup>rd</sup> BRICS Young Scientist Conclave, Durban, South Africa (25-29 June 2018)**

Thematic Area: Water – The Strategic Importance of Water Resources in the Context of Climate Change

The 3<sup>rd</sup> BRICS Young Scientist Conclave provided the following platform

- The BRICS young scientists and researchers involvement in the exchange perspective on transformative change, sustainable research partnerships, links and networks.
- Youth focused and their approaches towards innovative solutions to the indispensable socio-economic inconveniences.
- Exchange of academic and policy, further discussions among the youths from the BRICS nation.
- Interactive contact among the BRICS scientists, established scientist and researchers from the members of BRICS nation.

The Conclave comprised of the below mentioned activities:

1. Three parallel sessions on the thematic area of Energy, water and social science.
2. BRICS young women in Science Dialogue.
3. BRICS Young Innovator Prize.
4. Workshop on youth innovation and Entrepreneurship
5. Seminar on Science Diplomacy, Advice and Communication.

## **BRICS Young Women in Science Dialogue**

Young women in Science Dialogue placed in the conclave provided the platform for young women scientist and researchers to discuss pertinent issues and challenges in institutions of higher learning and the workplace, in terms of career choices and mobility, and equality and empowerment, and discuss country perspectives and approaches on practical solutions to these challenges at the industrial and policy levels. Discussed on the issues related to gender blindness or gender neutrality in Science Technology and innovation (STI) in BRICS and other countries. Inclusion in the aspects of socio-economic, health and other effects of women in STI. In the Global picture women make up just 30% of researchers in Science Technology and innovation, therefore more chance to be offered to woman through special schemes. The number of prestigious prizes in STEM field's needs to be increased and with proper recognition. The share of women's in life and physical sciences has gone up but it has gone down for computer job since 1990. The obstacles of stereotyping men as scientists. Women outperform men in math classes throughout high school and colleges. Sex discrimination needs to be avoided in journal publications and sanction of research grants etc. Women with children work 100+ hours per week comparatively higher than the men with children work 88 hours per week. The world is changing, even more and more children recognize women as scientists. Women are different, and bring unique attributes to the table to strategies on complex scientific subjects with unique perspectives. Women will rise to the top, and nothing will keep her down, but it takes very hard work and many experiences.

### **Three parallel sessions on the thematic area of Energy, water and social science**

Sessions on Energy, Water and Social Sciences

Energy: The present and Future Energy Imperatives of BRICS Economies

Water: The Strategic Importance of Water Resources in the context of Climate change.

Social Science: The challenges of Modern ICT Technologies on youth cultural choices

With my research expertise in the water theme, I have delivered talk on "A green technology for the elimination of hazardous water contaminants", as one among the 30 presenters. The broad aspects of water cycle, water remediation, issues of mine-impacted water, advance treatment technologies, solutions from the impact of Science, Engineering and Technology addressed in water quality, water resource management, desalination technology, ecological infrastructure etc., were discussed in the context of BRICS nations. Climate change is expected to have dramatic effects on the water resources of not only the BRICS countries but also all others around the world. It poses a great challenge to scientists, policymakers and water program managers in the sustainable management of water resources. There is an urgent need to address the various issues related to water resource management like combined sewer system overflows, assessing effects on water quality standards, and protecting surface and sub-surface potable water from the intrusion of saline water due to sea level rise.

The recommendations of the session (India) are mention below

#### Water Resources Preservation, Harvesting, and Management:

- IoT intervention (Data collection, analysis, and prediction) in hydrogeological mapping for water resources to step in early measures.
- Preservation and management of natural water resources (rivers, surface water, and groundwater) reservoirs.
- Water harvesting (rain, flood) through (watershed) and management via structural and technological intervention.
- Technological interventions for decentralized wastewater treatment for rural and peri-urban communities.
- Modalities to utilize untapped water resources (Ocean, glaciers, coastal, etc.)
- Promoting grassroots innovation such as “Water on the wheel” for the rural community.
- Promoting water conservation techniques such as micro-irrigation, transgenic crops, hydroponic systems, etc.

#### Water Pollution Monitoring, Control and Remediation:

- Geological mapping (as contaminant transport, ecological and climate change) to understand the evolution of water pollutants regionally.
- Real-time monitoring of water resources as well as regulatory control of point of sources.
- Societal intervention through low cost and user-friendly sensor/kits solutions.
- Toxicological assessment of existing as well as emerging pollutants onto the natural ecosystem and human health.
- Holistic, a sustainable and economical end to end solution for hazardous pollutants remediation.
- Technological solution for acid-mine and agricultural water monitoring and treatment area to be tapped for BRICS countries.

Possible policy interventions to support above efforts:

- Identification, exchange, and adoption of technologies and practices with proven credentials related to water
- Initiating joint exchange programs, projects, establishing shared digital data platforms, knowledge exchange platform
- Issuing joint calls to develop technologies for unaddressed problems or where the available technology is sub-optimal
- Organising national campaigns in BRICS member countries for sensitization and generating awareness amongst various stakeholders on water-related issues incorporating BRICS best practices.
- Jointly developing systems and mechanisms for real-time monitoring of quality of potable water, inland water bodies, wetlands, and for water desalination and water treatment plants.

The approaches of the other BRICS nations are follows:

South Africa:

1. Rethinking current strategies (challenging the status quo)
2. Transdisciplinary approach
3. Governance/Policy interventions

4. Innovation & entrepreneurship
5. Communication:
6. Research:

#### Brazil:

Improvement of the reuse of water, and development of technology for water management, to minimize the amount of water withdrawn from surface and groundwater.

Start a program of biomonitoring of contamination in aquatic life, evaluating the effects of pollution at the organismic level (e.g. using biomarkers), and the effects of pollution on the ecological web of life and on ecosystem services.

Improvement of the network for monitoring water quality throughout the countries.

Increased investment in wastewater treatment plants.

Research on climate change by scientists from BRICS nations should be carried out continuously in long-term programs, to better understand the effects of global climate changes on both the future availability and demand for water and its consequences to each country.

#### Russia:

##### Internal water management

Updating water infrastructure.

Development efficient system of irrigation.

Climate change adaptation and mitigation strategies at national, regional and local levels.

Biodiversity and ecosystem protection.

##### External water management:

Coordinate efforts to manage water resources.

Environmental protection and quality control.

Joint monitoring of water flows.

Floods, dams and reservoir cooperation.

Technical projects.

#### China:

Water pollution decontamination.

Upgrading and constructing water treatment facilities and technologies (e.g. desalination and mining water use).

Adequate sanitation for all in China.

Fully and sustainable utilize green and blue water without wastage.

Public have a strong sense of recycling and water saving, so to encourage this through policy.

Water research: transdisciplinary (i.e. combine social sciences and management sciences)

Develop an environmentally friendly industrial economy.

### **Seminar on Science Diplomacy, Advice and Communication**

The BRICS nations scientific organizations have vital role in science diplomacy. The scientific communities are advised to form different network of research partnerships. The network should be expanded to involve governmental, non-governmental organizations, agencies, etc. The dialogues between the policymakers, scholastic and scientist to categorize projects and suitable processes. Exploring the resources of intellectual to science as significant component of modern day diplomacy. The scientific community needs to be encouraged and support at all levels. Younger scientists requires more opportunities and occupation motivation to support early stage careers.

### **Workshop on Youth Innovation and Entrepreneurship**

Conducted for the special recognition of young talented entrepreneurs and researchers, their outstanding innovation for the benefit of the socio-economic environment and conditions of life in BRICS nation. Youth innovation based on the address to the question of "how to set up innovation ecosystem for the youth and how the BRICS countries can support each other in this strategic endeavor?" Further, examine questions related to the translations of the research work outcomes of young scientist into marketable products and services. Based on the possible outcome, there could be a agreement to set up platform for BRICS young innovation.

The following are the innovative research presented

Agrosmart network associated with the merits of collect and integrate data from soil, crop, weather and seed genetics by using in field sensors and third party database. Involves the initial diagnosis of the region, Initial adaptation strategy, Sensors and monitoring network, and hyperlocal monitoring system. Technology is more attractive for new generations, Higher value

of added work, Reduced risk, and Increase income. Advanced instrument can be used as Simple device to use at school, possible to use at research institution, module structure, remote data transmission, 3 main functions in one device (scanning probe microscopy, ion-conductance microscopy, and electromechanical sensor) and Google for blind.

### **SUGGESTIONS:**

Out of five days programme, at least 3 days may be allotted for the Young Scientist presentation followed with interaction, based on research theme. Minimum 20 minutes may be provided for presentation rather than 7 minutes.

This report was prepared by,

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