

**INTERNATIONAL WORKSHOP  
ON  
GROUND WATER CONSERVATION AND  
MANAGEMENT BY LEVERAGING  
SCIENCE, TECHNOLOGY, AND INNOVATION  
(IWGWCM- STI 2021)**

**27-28 JANUARY 2021  
(VIRTUAL – MODE)**



A Kenya's Vision 2030 Initiative



## INTRODUCTION

The importance of quality water to life on Earth cannot be over emphasized, and it's because of this it was included in the UN's 17 Sustainable Development Goals as Goal No. 6 (Ensure availability and sustainable management of water and sanitation for all) and its 8 targets. Water is, therefore, intricately linked directly or indirectly to almost all the SDGs as it is essential for sustainable life on Earth, poverty eradication, gender equality, food security and the conservation of ecosystems. For example, food security is dependent on water security, and this water-food security nexus is important not only for SDG 2 (Zero hunger) and SDG 6 (Clean and affordable water and sanitation), but also for poverty reduction (SDG 1) and good health (SDG 3).

Water scarcity is a challenge to advancing the humane goals of eradicating extreme poverty and hunger, human health and food security and generally a threat to achieving sustainable development. Increasing human population is already exerting enormous pressure on available water resources leading to the many challenges facing the water sector including unsustainable extraction of groundwater leading to decline in aquifers, reduced stream flows, pollution, depletion of groundwater and aquifers, and surface water resulting in water scarcity and compromising water quality. Changes in groundwater availability and quality impact human health, livelihoods, food security and national economic development. Accelerated attainment of the SDGs requires concerted efforts to not only address the problem of water security but also the drivers at various levels.

Effective management of water resources will, therefore, require application of a combination of strategies beyond the conventional ones to include leveraging and deployment of Science, Technology, and Innovation (STI). Improving management and conservation of groundwater requires understanding of groundwater systems and aquifer characteristics in a changing environment, while groundwater protection and remediation can benefit from advances in innovation systems. The application of STI in natural resource management is gaining traction because some of the emerging technologies have proved cost-effective and more efficient saving on costs, time and with a potential to contribute to conservation and sustainability. For example, the application of STI in water conservation and management in groundwater mapping (e.g. use of satellite technology), map aquifer outcrops and consumptive use of groundwater, as well as direct estimation of total actual evapo-transpiration at high resolution, modeling, irrigation technologies (for water efficiency and improving groundwater for human consumption and crop irrigation), water purification technologies, water storage technologies, water lifting, planting technology for increased water efficiency, water desalination technologies, wastewater reuse, conservation agriculture, portable sensors for groundwater detection is well documented. With emerging advances in STI and its applications especially during this Fourth Industrial Revolution, a paradigm shift is emerging, which seeks to understand and embrace the role of STI to

address existential societal problems and improve the quality of life for current and future generations. The application of these STI in groundwater conservation and management is now even more important given the emerging environmental challenges associated with climate change, extreme weather, unpredictable rainfall patterns, water scarcity and land degradation. Sustainable groundwater conservation and management contributes to SDG 15 because many aquatic ecosystems and their biodiversity depend on groundwater. Water security promotes peaceful coexistence as it prevents water-related conflicts thus contributing to SDG 16.

The importance of sharing best practices, lessons learnt and promoting knowledge and information sharing on the emerging trends in application of STI in groundwater conservation and management cannot be disputed. In view of this, the *Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre)*, New Delhi, India jointly with the *Kenya National Commission for UNESCO (KNATCOM)*, Nairobi, Kenya will be organizing an International Workshop on '**Ground Water Conservation and Management by Leveraging Science, Technology and Innovation**' (IWGWCM - STI 2021) during **27-28 January 2021**. The Workshop will be hosted by KNATCOM and organised in [Virtual-Mode](#).

## **WORKSHOP OBJECTIVES**

The Workshop will be organized in different sessions to cover the application of Science, Technology and Innovation (STI) on conservation and management of groundwater resources in a changing environment. The Workshop aims to:

- highlight the importance of groundwater to achieving sustainable development goals;
- discuss current threats and challenges to sustainable groundwater management;
- provide a platform for researchers and practitioners from various disciplines to share experiences and lessons learnt in the application of STI in conservation and management of ground water;
- showcase the applications of STI and innovation systems in groundwater conservation and management; and
- promote international cooperation in application of STI for groundwater conservation and management.

## TOPICS TO BE COVERED

- Role of groundwater in sustainable development,
- STI and improving groundwater access through reticulation,
- STI in groundwater detection and mapping,
- STI and efficiency in use of groundwater,
- STI and direct estimation of total actual evapo-transpiration at high resolution,
- STI and groundwater modeling,
- STI and irrigation technologies for water efficiency and improving groundwater for human consumption and crop irrigation,
- New emerging desalination and water purification technologies,
- STI and water storage technologies,
- STI and wastewater treatment, recycling and reuse technologies,
- STI, groundwater pollution and remediation,
- STI and groundwater monitoring,
- International policies in groundwater conservation and management

## IMPORTANT DATES

<b><u>ACTIVITY</u></b>	<b><u>DATES</u></b>
<b>Registration/Submission of Application (along with the Extended Abstract) Starts</b>	<b>30 November 2020</b>
<b>Last date of Submission of Application (along with Extended Abstract)</b>	<b>31 December 2020</b>
<b>Deadline for Confirmation of Abstract Acceptance/Selection of Applicants</b>	<b>15 January 2021</b>
<b>Deadline for Submission of Manuscripts</b>	<b>15 January 2021</b>
<b>Issue Online Conference Link to Participants</b>	<b>20 January 2021</b>
<b>Workshop Dates</b>	<b>27 (Wednesday) - 28 (Thursday) January 2021</b>

## PROGRAMME OF THE WORKSHOP

Date	Programme (East African Time) [GMT+ 3:00]			
	10.00 -11:00	11.00 - 12.30	13.30 - 15.00	15.00 - 16.30
<b>27<sup>th</sup> January 2021</b>	<b>Official Opening</b>	<b>Plenary Session / Keynote Lecture – I</b>	<b>Technical Session – I  (Presentation by Participants)</b>	<b>Technical Session – II  (Presentation by Participants)</b>
<b>28<sup>th</sup> January 2021</b>	<b>Plenary Session / Keynote Lecture– II</b>	<b>Technical Session – III  (Presentation by Participants)</b>	<b>Technical Session – IV  (Presentation by Participants)</b>	<b>Concluding Session, Discussions &amp; Adoption of Resolutions</b>

*Note: A detailed session-wise programme will be made available to all the selected participants before the Workshop.*

### TARGET PARTICIPANTS

Researchers, scientists, government officials, policy makers, water-sector professionals and managers and representatives from industry and non-government organizations from various countries including the developed nations and NAM and other developing countries who are engaged in R&D, generation, promotion and policy making on various groundwater sub-sectors are invited to participate in this Virtual-Workshop.

The interaction of participants from various countries will allow exchange of knowledge, ideas and experiences as well as provide opportunities for global networking and collaborations. The selection of the participants will be strictly based on merit and relevance of their current responsibilities to the subject of the Workshop as well as the quality of the abstracts of the paper submitted by them along with the completed nomination form.

### CERTIFICATION

E- Certificates will be awarded to participants upon successful completion of the Workshop.

## **RESOURCE PERSONS**

The resource persons for the Workshop will comprise eminent experts and professionals in the relevant fields from Kenya, India and other countries.

## **ABOUT THE ORGANISERS**

### **NAM S&T CENTRE**

The Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre) New Delhi is an Inter-governmental Organization with a Membership of 47 countries spread over Asia, Africa, Middle East and Latin America. The Centre was set-up in 1989 in New Delhi, India in pursuance of the decisions of various NAM Summits with the objective of promoting mutually beneficial cooperation among the NAM and other developing countries for collective self-reliance.



The Centre undertakes a variety of programmes, including organization of International Workshops, Conferences and Training Courses, and implementation of Collaborative S&T Projects. It also offers short-term Research Fellowships to Scientists and Technologists from developing countries in association with the Centres of Excellence in various countries. The Centre also brings out books and other scientific publications in different subjects that are of interest to developing countries.

The Centre's activities provide opportunity for scientist-to-scientist contact and interactions, familiarizing participants on the latest developments and techniques in the subject areas, identification of the requirements of training and expert assistance, locating technologies for transfer between the Members and other developing countries, and dissemination of STI information etc. In addition, the Centre encourages Academic-R&D-Industry interactions in the developing countries through its NAM S&T-Industry Network.

### **KENYA NATIONAL COMMISSION FOR UNESCO**

The Kenya National Commission (KNATCOM) for UNESCO ([www.unesco.go.ke](http://www.unesco.go.ke)) is a State Corporation established with the mandate of promoting and building of peace, eradication of poverty, sustainable development and intellectual dialogue through education, sciences, culture and communication and information. The organization seeks to be a leading organization in the advancement of peace, sustainable development and intellectual collaboration.



KNATCOM's mandate is to promote Kenya's national interests in UNESCO and UNESCO's international interests in Kenya, regionally and globally in the areas of education, sciences, culture, and communication and information.

To achieve this mandate, the Commission mobilizes technical and information resources from UNESCO among other partners; promotes collaborations between national and international institutions; promotes knowledge and information sharing; facilitates national, regional and international policy formulation in the fields of education, sciences, culture and communication and information among other functions. The need to manage groundwater resources is essential and hence water is an important thematic area under the natural sciences programme of the Commission but also consistent with the priorities under UNESCO's Intergovernmental Hydrological Programme.

## **SUBMISSION OF APPLICATIONS**

Scientists, researchers and other professionals desirous of participating in the Workshop should submit their application electronically to Dr. Amitava Bandopadhyay, Director, General, NAM S&T Centre (Email: [namstcentre@gmail.com](mailto:namstcentre@gmail.com)) as early as possible but latest by **Thursday, 31 December 2020**.

Interested applicants from Kenya and Africa (who are not Members of the NAM S&T Centre) should, submit their requests directly to Dr. George Eshiamwata, Deputy Director, Natural Sciences ([g.eshiamwata@unesco.go.ke](mailto:g.eshiamwata@unesco.go.ke)) and copied to Dr. Jaro Arero, Director, Natural Sciences Programme, Kenya National Commission for UNESCO (Email: [jarero@unesco.go.ke](mailto:jarero@unesco.go.ke)).

Participants are welcome to submit abstracts and papers. However, the Workshop is also open to all scientists and professionals with an interest in water management and conservation who may not necessarily present papers.

The following documents must be submitted as e-mail attachments:

- i.** Filled-in **Application Form** (Blank-form enclosed)
- ii.** An **Opinion** (a short paragraph; in MS-Word only) on what qualifies you to participate in the Workshop
- iii.** A **Short CV** (maximum two pages in the format enclosed; in MS-Word only)
- iv.** An **Extended Abstract** (in MS-Word only) of the Paper that would be presented at the Workshop (about 1-1 ½ pages)

*Note: The documents at (ii), (iii) and (iv) above must be in MS-Word format only; PDF or image files will not be accepted. Hard copies of the Nomination Form and the above attachments are **NOT REQUIRED** to be submitted.*

## **PRESENTATION OF PAPERS**

Delegates/Participants are welcome to present a Country Status Report and/or a research/ scientific paper on any of the themes appropriate to the Workshop.

## **PUBLICATION OF PROCEEDINGS OF THE WORKSHOP**

A Publication edited by one or more international experts and based on the papers presented by the participants during the Workshop and also containing papers contributed by other eminent experts in the field will be published in the form of a book as follow-up of this Workshop. Therefore, all participants are requested to submit the manuscripts of their full papers in MS-Word format only well in advance, but latest by **15 January 2021**.

## **SELECTION OF APPLICANTS**

Selection of applicants will be made based on their academic and professional background, and relevance of their current engagements in the relevant field. Successful applicants will be electronically informed about their selection by **15 January 2021**.

The details about the virtual-platform that will be used for the conference including the log-in details will also be communicated to all the selected applicants by **20 January 2021**. Other details and terms & conditions for the participation of scientists from various countries will be given to the individual candidates on receipt of their applications.

## **SECRETARIAT AND ENQUIRIES**

### **NAM S&T CENTRE**

#### **Dr. Amitava Bandopadhyay**

Director General

Centre for Science & Technology of the Non-Aligned and other Developing Countries  
(NAM S&T Centre)

Zone-6A, 2nd Floor, India Habitat Centre, Lodhi Road

New Delhi – 110003, India

Tel: +91-11-24645134, 24644974; Fax: +91-11-24644973

E-mail: [namstcentre@gmail.com](mailto:namstcentre@gmail.com)

Website: <http://www.namstct.org>

#### **Mr. M. Bandyopadhyay**

Senior Adviser

NAM S&T Centre, New Delhi

Tel: +91-11-24645134, 24644974; Fax: +91-11-24644973

E-mail: [namstcentre@gmail.com](mailto:namstcentre@gmail.com)



**KENYA NATIONAL COMMISSION FOR UNESCO (KNATCOM)**

**Dr. Jaro Arero**

Director –Natural Sciences  
Natural Sciences Programme,  
Kenya National Commission for UNESCO (KNATCOM)  
National Bank Building, 16th Floor  
Harambee Avenue P.O. Box 72107-00200, Nairobi, Kenya  
Email: [jarero@unesco.go.ke](mailto:jarero@unesco.go.ke)  
Website: [www.unesco.go.ke](http://www.unesco.go.ke)

**Dr. George W. Eshiamwata**

Deputy Director –Natural Sciences  
Natural Sciences Programme  
Kenya National Commission for UNESCO (KNATCOM)  
National Bank Building, 16th Floor  
Harambee Avenue P.O. Box 72107-00200, Nairobi, Kenya  
Telephone: 020-2229053/4  
Email: [g.eshiamwata@unesco.go.ke](mailto:g.eshiamwata@unesco.go.ke)

CENTRE FOR SCIENCE AND TECHNOLOGY OF THE NON-ALIGNED  
AND OTHER DEVELOPING COUNTRIES  
(NAM S&T CENTRE)

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(IWGWCM - STI 2021)**

**27-28 JANUARY, 2021**

**APPLICATION FORM**

PLEASE TYPE OR USE BLOCK CAPITALS  
(NO COLUMN SHOULD BE LEFT BLANK)

**SECTION –A**

(To be filled in by the Nominee)

- 1 First Name (Prof. /Dr. /Mr. /Mrs. /Ms.): .....
- Middle Name: ..... Last Name: .....
- 2 Father's / Spouse Name: .....
- 3 Designation (Position held): .....
- 4 Nationality: .....
- 5 Date of Birth: .....
- Place of Birth (City) .....(Country).....
- 6 Name of the Parent Institution (Employer): .....
- Full Address (Office): .....
- .....
- Phone: ..... Fax: .....

- E-mail: .....
- 7 Full Address (Home): .....  
 .....
- Phone: ..... Mobile: .....
- Fax: ..... E-mail: .....
- 8 Educational Qualifications: Highest Degree. ....  
 Year of Award: ..... University: .....
- Field of Study: .....
- 9 Brief Bio data (CV): .....  
*(Maximum two pages in MS Word only; to be attached on separate sheet as per the attached format)*
- 10 A Write-up (in MS-Word format only) on what qualifies you to attend the Workshop
- 11 An Extended Abstract (in MS-Word only) of the Paper that would be presented at the Workshop (about 1-1 ½ pages)
- Date: ..... Signature: .....

**SECTION –B**

**ENDORSEMENT BY THE NOMINATING AUTHORITY**

*(The Applicant in a member country of the NAM S&T Centre must get the Nomination Form endorsed by the Focal Point of the Centre in his/her country, if he/she wishes to take advantages extended to the official nominee of the country. For the list of member countries and names/ addresses of the Focal Points please visit the Centre’s official website; [www.namstct.org](http://www.namstct.org).)*

- Signature: .....
- Name (in full): .....
- Designation: .....
- Date: .....

**SEAL**

**Enclosures:**

1. A Brief CV (maximum two pages, as per attached format; in MS Word only)
2. An Opinion (in MS-Word format only) on what qualifies you to attend the Workshop
3. An Extended Abstract (in MS-Word only) of the Paper that would be presented at the Workshop (about 1-1 ½ pages)

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CENTRE FOR SCIENCE AND TECHNOLOGY OF THE NON-ALIGNED  
AND OTHER DEVELOPING COUNTRIES  
(NAM S&T CENTRE)

CURRICULUM VITAE

**1. Personal Details:**

**Name:** *(Prof./Dr./Mr./Mrs./Ms.)*

*Font Name: Times New Roman*

**Designation:** *Position Title*

*Font Size: 12*

**Present Employer:** *Full Address (Office)*

**City/State/Province:**

**Country:**

**Nationality:**

**Date of Birth:** *dd/mm/yyyy*

**Proficiency in English Language:**

**Permanent Address:** *Full Address (Home)*

**Gender:**

**Contact: Mobile:**

**Telephone Office:**

**Fax:**

**E-mail:**

**Alternative e-mail:**

**2. Academic Qualifications:** *In chronological order*

<b>Qualification Awarded</b> <i>Degree/Diploma/Certificate</i>	<b>Major Subject</b>	<b>University/ Institution</b>	<b>Year</b> <i>(From-To)</i>

**3. Professional Experience:** *In chronological order*

<b>Organisation/ Institution</b>	<b>Position Title</b>	<b>Year (From-To)</b>	<b>Nature of duties</b>
i.			
ii.			

*Total number of years of relevant experience –*

**4. Research Experience:** *In chronological order*

<b>Research Title</b>	<b>Duration</b>	<b>Status</b>

**5. Administrative Experience:** *Not more than 100 words*

**6. Experience with respect to the title of the Workshop:**

**7. Details of Awards/Recognitions (if any):**

**8. Any other information:** *Not more than 50 words*

**9. Recent Publications:** *Only five recent publications to be mentioned*