



सत्यमेव जयते
Embassy of India



ROUNDTABLE ON WATER

Water Management that Makes Business Sense

24 January @ 10am

SIBC Thematic Roundtables



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Embassy of India

Program



10:15–10:30 Welcome address – by **H.E. Monica Kapil Mohta**
Ambassador of the Republic of India to Sweden and
Latvia

10:30-11:10 Panel Speakers

10:30 Prosun Bhattacharya, PhD, KTH Royal Institute of
Technology

10:40 Katarina Veem, Director, Swedish Water House, SIWI

10:50 Jenny Grönwall, PhD, Programme Manager, SIWI

11:00 Cecilia Chatterjee-Martinson, WaterAid

11:10 Panel discussion

12:00-13:00 Networking Lunch

Moderator:

Prosun Bhattacharya, PhD, KTH Royal Institute of Technology





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Outline of Panel Session



10:30-11:10 **Panel Speakers**

- 10:30 Prosun Bhattacharya, PhD, KTH Royal Institute of Technology
Ensuring Safe Drinking Water - from Source to Consumers in a management, innovation and business context
- 10:40 Katarina Veem, Director, Swedish Water House, SIWI
Sweden Textile Water Initiative
- 10:50 Jenny Grönwall, PhD, Programme Manager, SIWI
Water management & regulation of the Indian textile industry
- 11:00 Cecilia Chatterjee-Martinson, WaterAid
The Business case for Water, Sanitation and Hygiene (WASH) in India
- 11:00 David Nilsson
Repositioning research for global water innovations
- 11:10 **Panel discussion**





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Safe Drinking Water - from Source to Consumers in a management, innovation and business context



Professor Dr. Prosun Bhattacharya

KTH-International Groundwater Arsenic Research Group, Department of Sustainable Development, Environmental Science and Engineering, KTH Royal Institute of Technology, Stockholm, Sweden

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and

Adjunct Professor

The University of Southern Queensland, School of Civil Engineering and Surveying & International Centre for Applied Climate Science, Toowoomba, Queensland, Australia

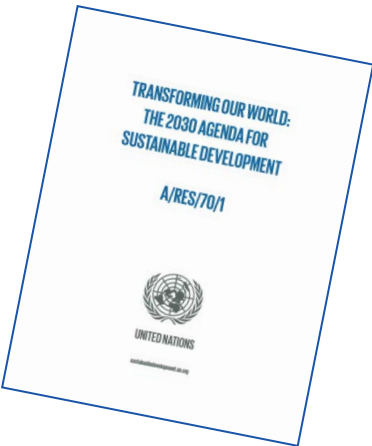
Prosun.Bhattacharya@usq.edu.au



Water – the Core of Sustainable Development

RAMBOLL

- ❖ Water and sanitation are at the very core of sustainable development, critical for thriving people, planet and prosperity.
- ❖ Water is needed for domestic, agricultural and industrial use, as well as for energy production, and these uses are highly inter-linked, often competitive and they generate wastewater that may cause pollution.
- ❖ Water is central to climate change, linking the influence of climate to the environmental and socio-economic systems; e.g. water scarcity and risk of flooding in others.
- ❖ Water is included in the 2030 Agenda as a dedicated Goal (SDG 6) to “*ensure availability and sustainable management of water and sanitation for all*”

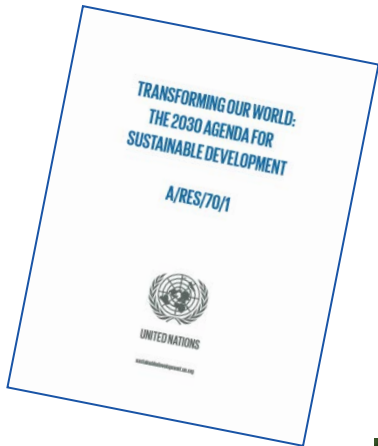


<http://www.unwater.org/sdgs/a-dedicated-water-goal/en/>

Water in the context of the 2030 Agenda

RAMBOLL

- ❖ SDG 6 expands the MDG focus on drinking water and sanitation to cover the entire water cycle
 - ❖ *including the management of water, wastewater and ecosystem resources.*
- ❖ Water forming the core of sustainable development, SDG 6 have strong linkages to all of the other SDGs, and underpins them;
 - ❖ *meeting SDG 6 would go a long way towards achieving much of the 2030 Agenda.*



<http://www.unwater.org/sdgs/a-dedicated-water-goal/en/>

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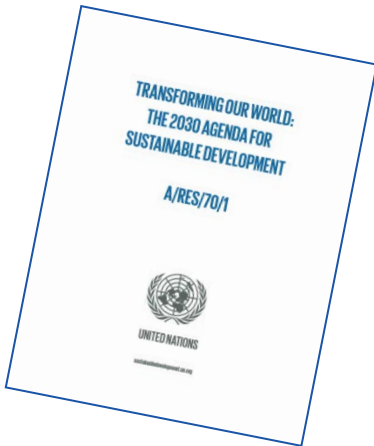
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The SDG 6: *Ensure availability and sustainable management of Water and Sanitation for all - Business Opportunities*

RAMBOLL

- ❖ **Target 6.1** “achieve universal and *equitable access to safe and affordable drinking water for all*”
- ❖ **Target 6.2** “access to *adequate and equitable sanitation and hygiene* for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations”
- ❖ **Target 6.3** “improve water quality by *reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials*, halving the proportion of untreated wastewater and *increasing recycling and safe reuse.....*”.



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<http://www.unwater.org/sdgs/a-dedicated-water-goal/en/>





The SDG 6: *Ensure availability and sustainable management of Water and Sanitation for all - Business Opportunities*

RAMBOLL

- ❖ **Target 6.4** “substantially *increase water-use efficiency* across all sectors and *ensure sustainable withdrawals and supply of freshwater* to address water scarcity and substantially reduce the number of people suffering from water scarcity”
- ❖ **Target 6.5** “implement *integrated water resources management* at all levels, including through transboundary cooperation
- ❖ **Target 6.6** “*By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes*”



TRANSFORMING OUR WORLD:
THE 2030 AGENDA FOR
SUSTAINABLE DEVELOPMENT

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<http://www.unwater.org/sdgs/a-dedicated-water-goal/en/>

The SDG 6: *Ensure availability and sustainable management of Water and Sanitation for all* - *Business Opportunities*

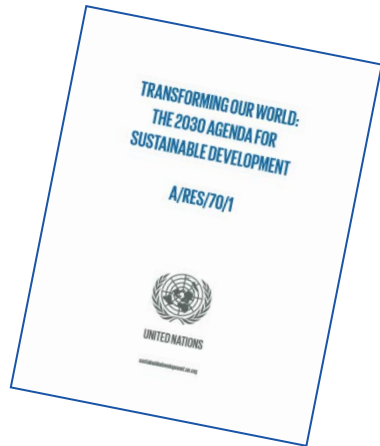
RAMBOLL

- ❖ **Target 6.a** “By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programs,

- ❖ *including water harvesting,*
- ❖ *desalination,*
- ❖ *water efficiency,*
- ❖ *wastewater treatment,*
- ❖ *recycling and reuse technologies”*

- ❖ **Target 6.b** “(Support and) Strengthen the *participation of local communities/stakeholders* in improving water and sanitation management”

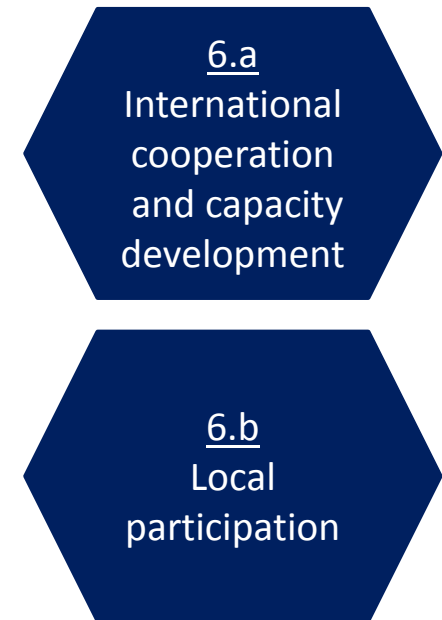
<http://www.unwater.org/sdgs/a-dedicated-water-goal/en/>



Identify - the Business Opportunities within the SDG Framework



Means of Implementation



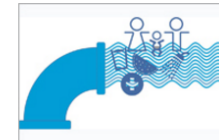
Indicators and Monitoring



Water sanitation hygiene

- Water sanitation hygiene
- ▶ Water safety and quality
- ▶ Sanitation and wastewater
- ▼ Monitoring and evidence
 - Investments and the enabling environment
 - Economics
 - Drinking-water, sanitation and hygiene monitoring
- ▶ Diseases and risks
 - Environmental health in emergencies
- ▶ Health-care facilities and waste
- Publications

UN-Water Global Analysis and Assessment of Sanitation and Drinking-water (GLAAS)



decisions for sanitation, drinking-water and hygiene.

The Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) is a UN-Water initiative implemented by WHO. The objective of GLAAS is to provide policy- and decision-makers at all levels with a reliable, easily accessible, comprehensive and global analysis of the investments and enabling environment to make informed

With 2.4 billion people living without access to improved sanitation facilities, and nearly 700 million people not receiving their drinking-water from improved water sources, GLAAS highlighted where efforts stagnated, and excelled, in achieving the Millennium Development Goal Target 7.C. – to halve, by 2015, the proportion of people without sustainable access to safe drinking-water and basic sanitation.

With the Sustainable Development Goals (SDGs), GLAAS will continue to provide information on investments and the enabling environment with a specific focus on monitoring Targets 6a and 6b:

- By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.
- Support and strengthen the participation of local communities in improving water and sanitation management.



Most recent publications

- GLAAS 2014 findings: Highlights for the Americas**
- TrackFin guidance document summary for decision-makers**
- GLAAS 2014 findings: Highlights for the South-East Asia Region**
- GLAAS 2014 findings**

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Means of Implementation

❖ Finance

- ❖ *Financial estimates suggest ~ USD \$50 billion per year through public finance of the countries*

❖ Technology

- ❖ *Using smart tools for water quality monitoring and reporting, decision-making, adaptable technologies*

❖ Capacity-building

- ❖ *investments that support the use, adaptation, and transfer of new technologies, in addition to public awareness and the dissemination of best practices*

❖ Data, monitoring, and accountability framework

- ❖ *coordinated, fit-for-purpose monitoring systems that serve multiple actors, scales, and applications.*

❖ Partnerships

- ❖ *recognize existing alliances, national and Global Partnership for Sustainable Development*



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Drinking water management

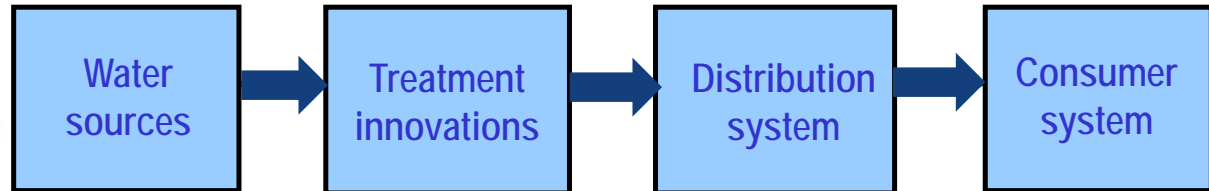
RAMBOLL

- ❖ Drinking water management encompasses an integrated process involves the source water, quality, the treatment systems and its efficiency, the distribution and storage system as well as the consumer system. through the use of a comprehensive *risk assessment* and *risk management* approach that encompasses all steps in water supply from catchment to consumer.



Drinking water management- The Water Safety Plans (WSP)

- ❖ Water Safety Plans (WSPs) entails the safety of a drinking-water supply through the use of a comprehensive *risk assessment* and *risk management* approach that encompasses all steps in water supply from catchment to consumer.



- ❖ *Key issues:* Assessing water quality-Availability, accessibility, quantity, ecological safety and risk management.

Drinking water management- The Water Safety Plans (WSP)

- ❖ Water Safety Plans (WSPs) with *three key components*, are guided by *health-based targets* (WHO DW guidelines, 2011) and overseen through drinking-water supply surveillance.



- ❖ System assessment
 - ❖ *to determine whether the drinking-water supply chain (up to the point of consumption) as a whole can deliver water of a quality that meets health-based targets.*
- ❖ Identifying control measures in a drinking-water system
 - ❖ *to control the identified risks and ensure compliance with health-based targets.*



Drinking water management- India

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Drinking water management- The Water Safety Plans (WSP)-System Assessment Examples

❖ National Water Resources Information System (WRIS)

Home | Ministry of Drink... x NRDWP Reports x ...

indiawater.gov.in/imisreports/nrdwpmain.aspx

Skip to main content | A A A A A

MINISTRY OF DRINKING WATER & SANITATION
National Rural Drinking Water Programme

MDWS Site | About the Site | Online Applications | Contact Us | HelpLine | Site Map | Themes

View Habitation details of your Village

Citizen Information Grievance Redressal

State

- ANDAMAN AND NICOBAR
- ANDHRA PRADESH
- ARUNACHAL PRADESH
- ASSAM
- BIHAR
- CHANDIGARH
- CHATTISGARH
- DADRA & NAGAR HAVELI
- DAMAN & DIU
- GOA
- GUJARAT
- HARYANA
- HIMACHAL PRADESH
- JAMMU AND KASHMIR
- JHARKHAND
- KARNATAKA
- KERALA
- LAKSHADWEEP
- MADHYA PRADESH
- MAHARASHTRA

About NRDWP

- NRDWP Guidelines- 2013
- Strategic plan 2011-2022
- Background Note (48.3 KB)
- Case Studies - Water (68.0 KB)

[B] Basic Information

- Format B1- Basic Habitation Information
- Format B2- List of LWE Districts
- Format B3- List of DDP Blocks
- Format B4- List of Minority Districts/Blocks
- Format B5- List of SC/ST Concentrated Habitations

[D] Financial Progress Reports

- Format D1 - Alloc, Rel & Exp (State wise)
- Format D2 - Alloc, Rel & Exp (District wise)
- Format D5 - List of Sanction Orders
- Format D8 A - Component wise Expenditure (State Wise)
- Format D16 - Complete Financial Status

[F] Data Entry Status

- Format F19 - Entry Status of reason for delay of schemes (New)
- Format F18 - Estimated Cost of covering Ar/Fl Habitations (New)
- Format F17 - Entry Status of Physical Progress %age of Ongoing Schemes (New)
- Format F16-No of Implementing Agencies
- Format F4- Yearly Data Updation

[A] Alerts

- Format A16- Duplicate Data in Habitation Directory
- Format A12- Completed Schemes in ProjectShelf with No Expenditure & no subsequent data
- Format A18- Scheme where Expenditure reported with No Physical Progress
- Format A11- Completed Schemes in ProjectShelf with No Expenditure
- Format A13- Differences in IMIS & Census 2011 Village list

[C] Physical Progress Reports

- Format C14 - Progressive Coverage Status (MPR)
- Format C14 A - Progressive Coverage Status (MPR Unapproved Data)
- Format C29 - Progressive Expenditure Status
- Format C16 - Financial And Physical Progress
- Format 1 - Target Habitations & Achievement

[E] Water QM & Surveillance

- Format E1 - Contamination wise Report
- Format E1A - Newly Emerged contamination wise report
- Format E2 - Water Sample testing(Labwise)
- Format E4 - FinancialYear wise Sample Testing Details
- Format E3 - Water Sample testing(Habitation wise)

[G] Annual Action Plan

- FORMAT -1 National Rural Drinking Water Programme
- Format 1A -AAP Physical targets coverage of Habitations
- FORMAT -2 NRDWP - Financial Progress
- FORMAT -3 NRDWP Financial Progress -II
- FORMAT -4 NRDWP(Coverage) Details of provision of water supply to Schools and Aganwadies

Select Language

Data Entry

Mobile App (mRWS)

National Water Quality Sub-Mission

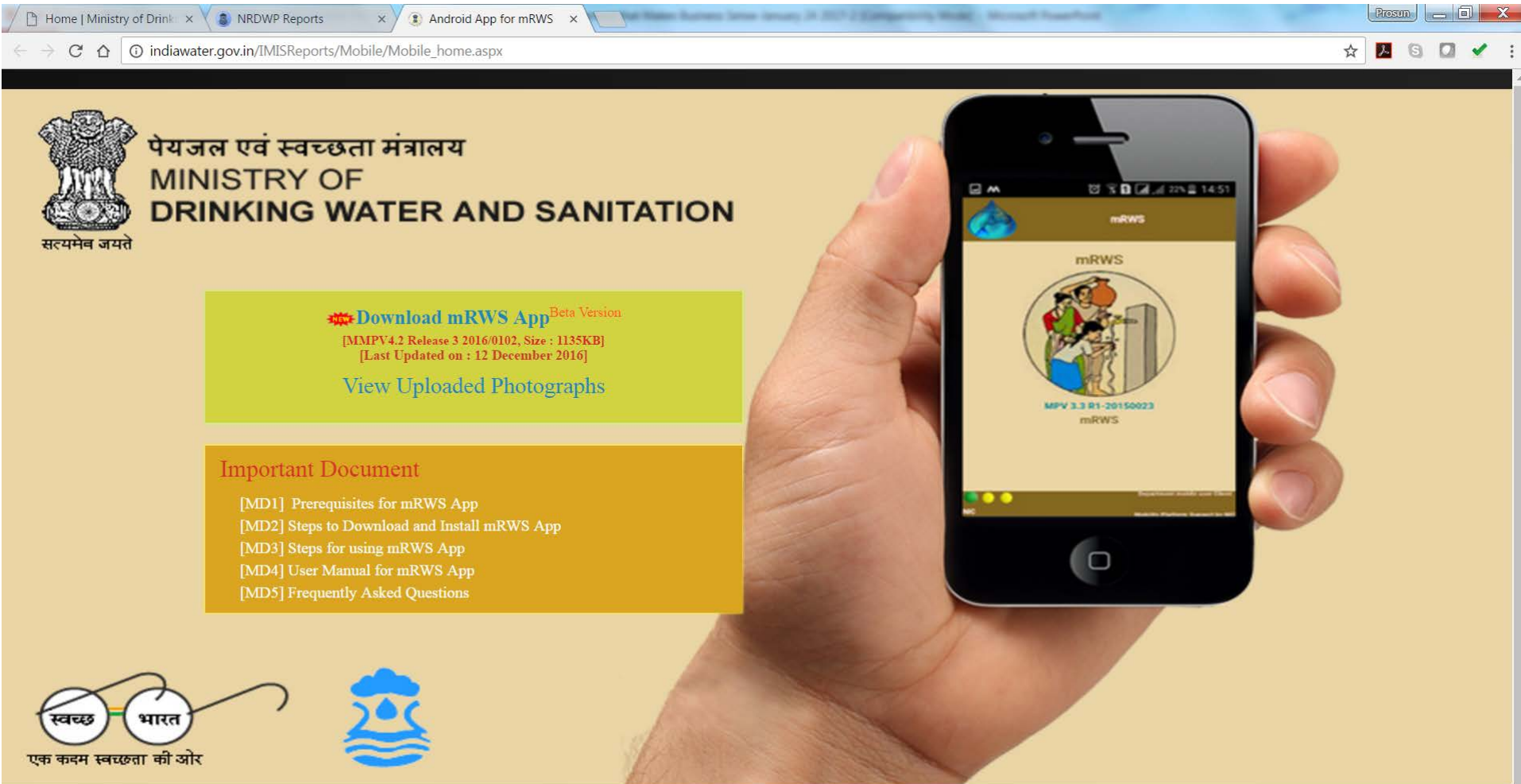
Pilot Project Monitoring System

RWSSP - LIS (NNP)



Drinking water management- The Water Safety Plans (WSP)-System Assessment Examples

❖ Mobile Rural Water Supply App (mRWS)



Home | Ministry of Drink... x NRDWP Reports x Android App for mRWS x

indiawater.gov.in/IMISReports/Mobile/Mobile_home.aspx

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MINISTRY OF
DRINKING WATER AND SANITATION

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Download mRWS App Beta Version
[MMPV4.2 Release 3 2016/0102, Size : 1135KB]
[Last Updated on : 12 December 2016]

[View Uploaded Photographs](#)

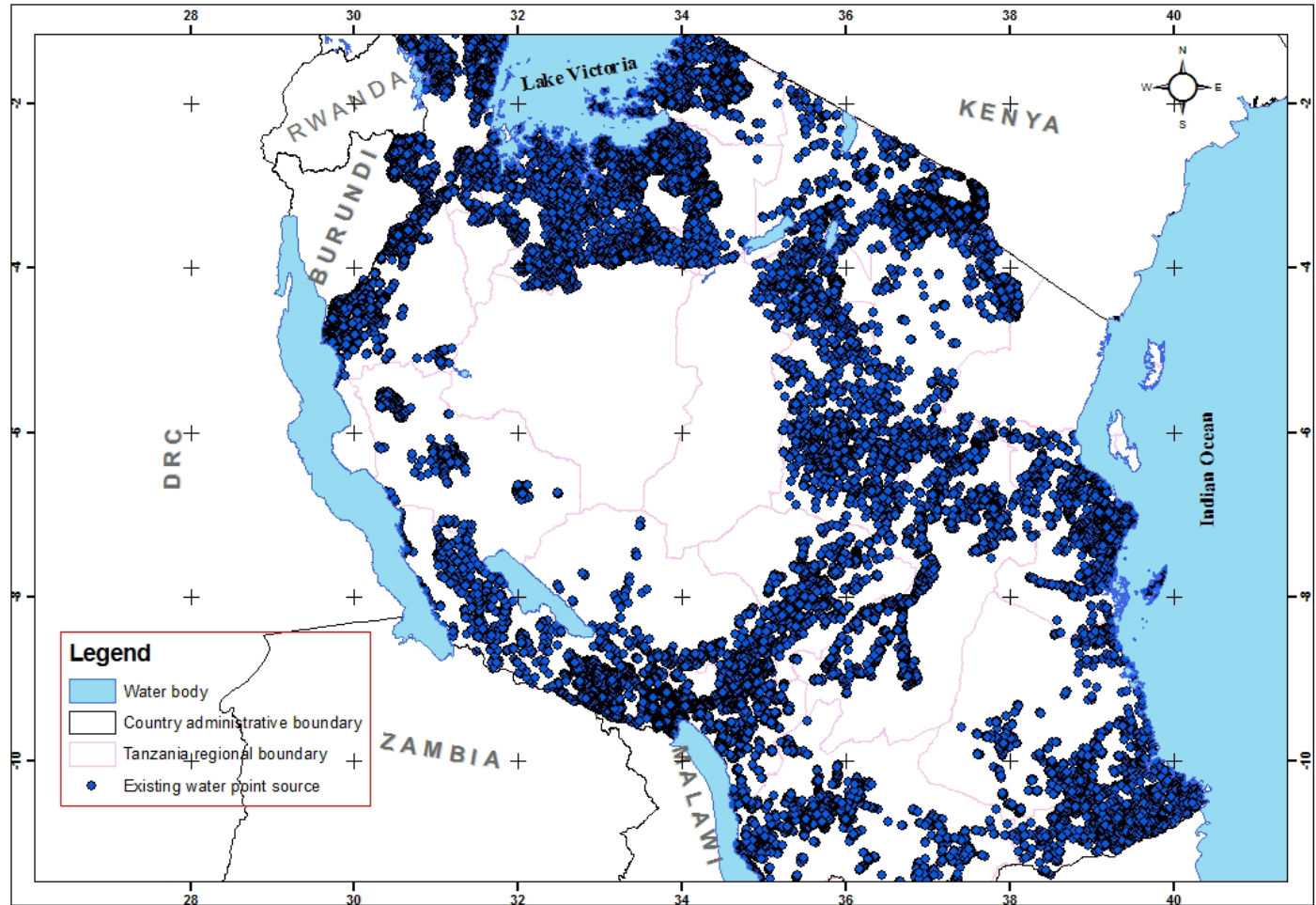
Important Document

- [MD1] Prerequisites for mRWS App
- [MD2] Steps to Download and Install mRWS App
- [MD3] Steps for using mRWS App
- [MD4] User Manual for mRWS App
- [MD5] Frequently Asked Questions

स्वच्छ भारत
एक कदम स्वच्छता की ओर

MPV 3.3 R1-20150023
mRWS

❖ National Water Point Mapping (Tanzania)



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❖ Geogenic Contaminants

Science of the Total Environment xxx (2016) xxx-xxx



Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv



Medical geology in the framework of the sustainable development goals

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Drinking water management- The Water Safety Plans (WSP)-System Assessment Examples

❖ Geogenic Contaminants

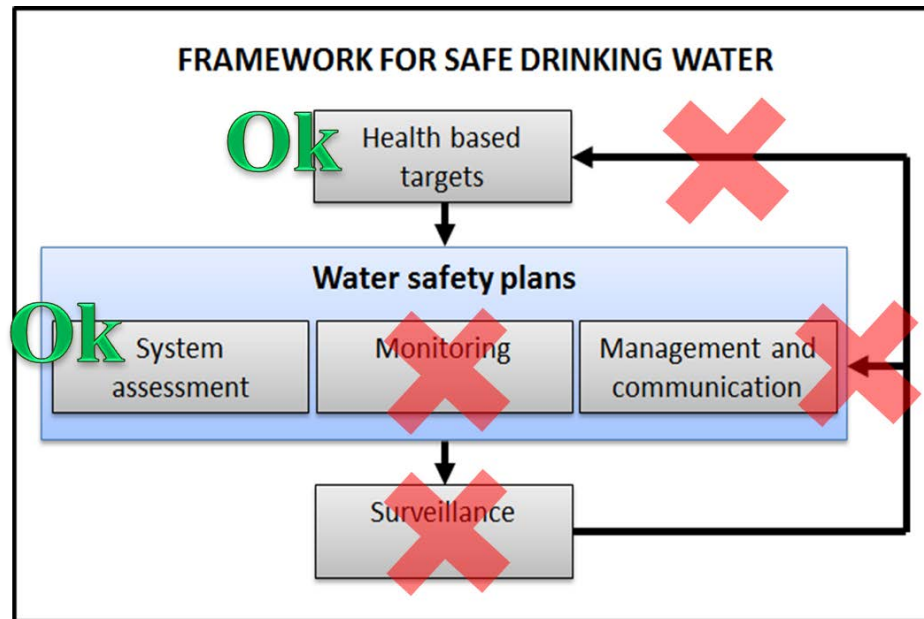


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- ❖ Management plans

- ❖ *describing actions to be taken during normal operation or incident conditions and documenting the system assessment (including upgrade and improvement)*
- ❖ *monitoring and communication plans and supporting programs*





Summary of the WSP - Business opportunities for result-based outcomes

RAMBOLL

- ❖ *development of an understanding of the system and its capability to supply water that meets health-based targets;*
- ❖ *identification of potential sources of contamination and control measures;*
- ❖ **validation** of control measures deployed to control hazards;
- ❖ **implementation of a system for monitoring** the control measures within the water system;
- ❖ **timely corrective actions** to ensure that safe water is consistently supplied; and
- ❖ *undertaking verification of drinking-water quality to ensure that the WSP is being implemented correctly and is achieving the performance required to meet health-based DW standards.*



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National Water Policy (2012) and National Water Framework Act (Draft, 2016)

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Government of India
Ministry of Water Resources

NATIONAL WATER POLICY (2012)

Government of India
Ministry of Water Resources
NATIONAL WATER POLICY (2012)

1. PREAMBLE

1.1 A scarce natural resource, water is fundamental to life, livelihood, food security and sustainable development. India has more than 18 % of the world's population, but has only 4% of world's renewable water resources and 2.4% of world's land area. There are further limits on utilizable quantities of water owing to uneven distribution over time and space. In addition, there are challenges of frequent floods and droughts in one or the other part of the country. With a growing population and rising needs of a fast developing nation as well as the given indications of the impact of climate change, availability of utilizable water will be under further strain in future with the possibility of deepening water conflicts among different user groups. Low consciousness about the scarcity of water and its life sustaining and economic value results in its mismanagement, wastage, and inefficient use, as also pollution and reduction of flows below minimum ecological needs. In addition, there are inequities in distribution and lack of a unified perspective in planning, management and use of water resources. The objective of the National Water Policy is to take cognizance of the existing situation, to propose a framework for creation of a system of laws and institutions and for a plan of action with a unified national perspective.

1. PREAMBLE

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National Water Framework Act (Draft, 2016)

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DRAFT NATIONAL WATER FRAMEWORK BILL, 2016

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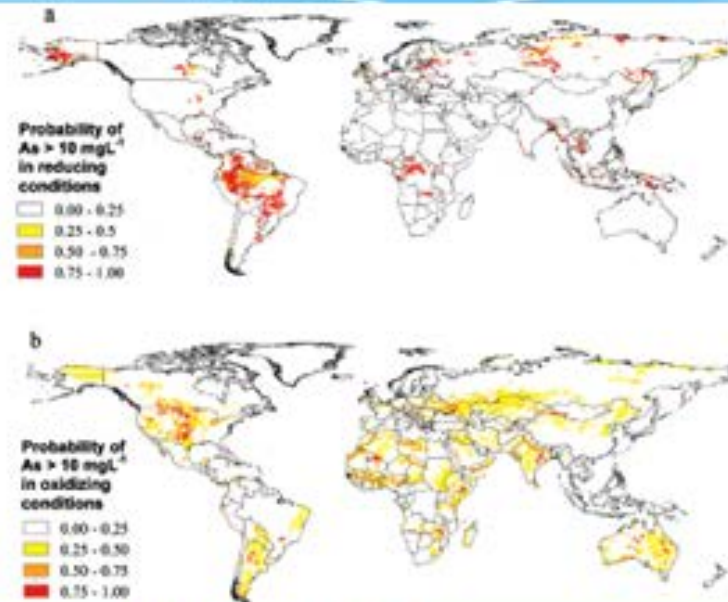
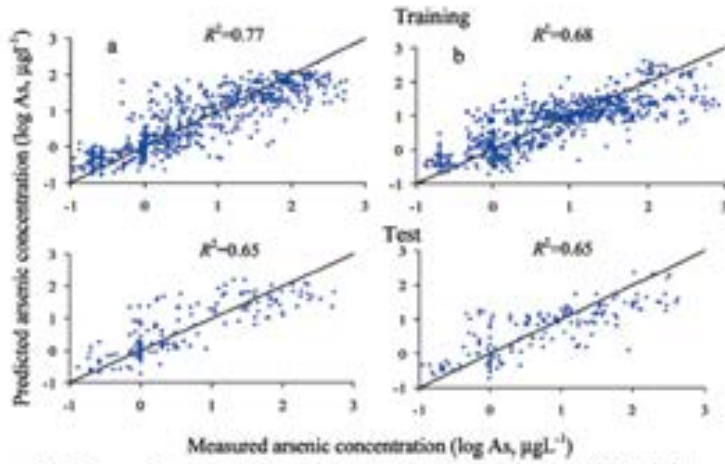
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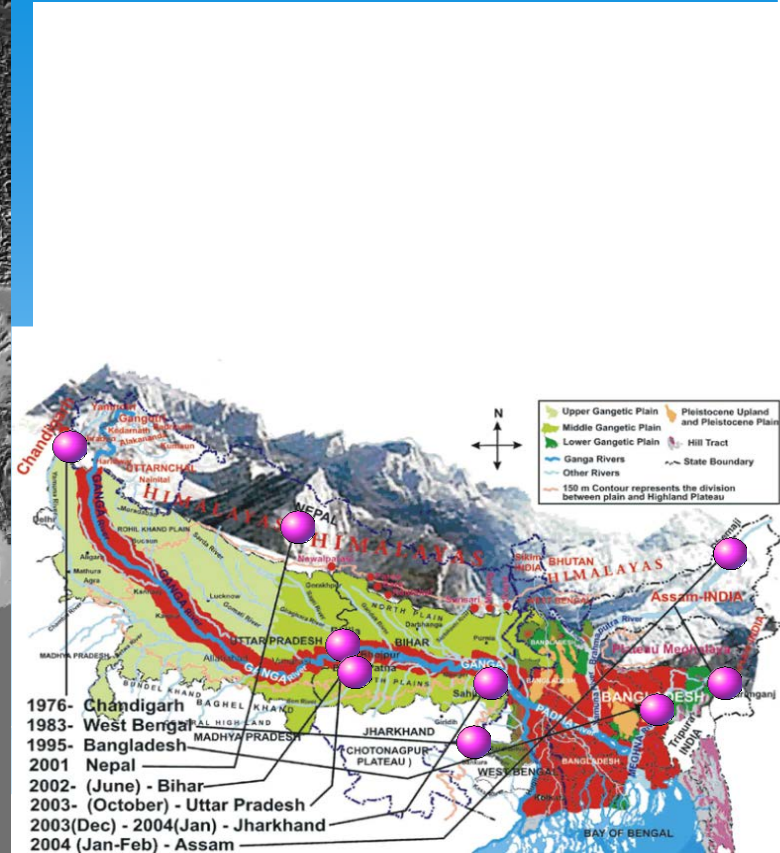
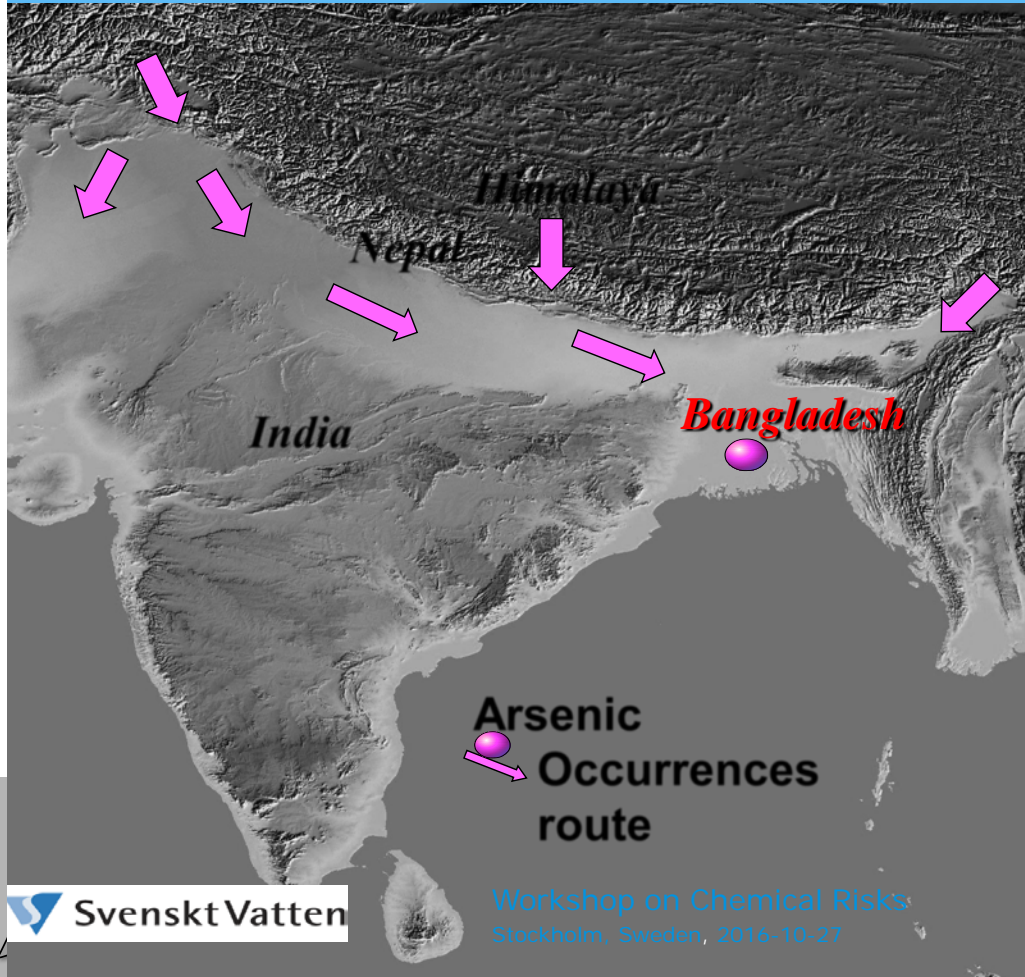
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Global Scenario of Elevated As in groundwater-predictive mapping (Amini et al., 2008)



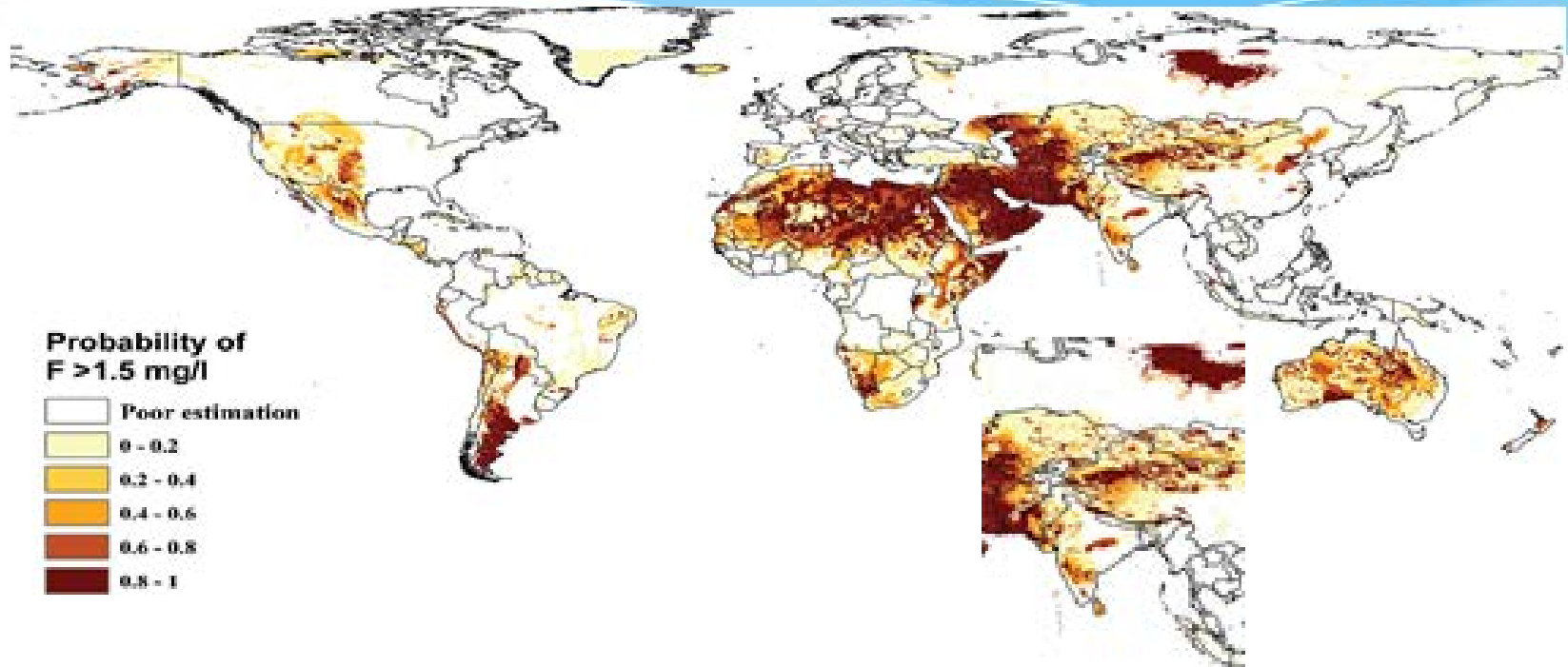
ENVIRONMENTAL SCIENCE & TECHNOLOGY / VOL. xxx, NO. xx, XXXX

Source water contamination: Arsenic



Source water contamination: Fluoride

Probability of fluoride concentration in groundwater exceeding the WHO guideline for drinking water of 1.5 mg/L





Example of innovative technology for arsenic removal (AOCF)

UNIVERSITY OF SOUTHERN QUEENSLAND AUSTRALIA

watershare®

Watershare Tool for Guidance on Arsenic Removal to $< 1 \mu\text{g/L}$ (ARS-REM)

Prosun Bhattacharya (USQ)
Jochen Bundschuh (USQ)
Arslan Ahmad (KWR)

KTH-International
Groundwater Arsenic
Research Group

17
2000-2017

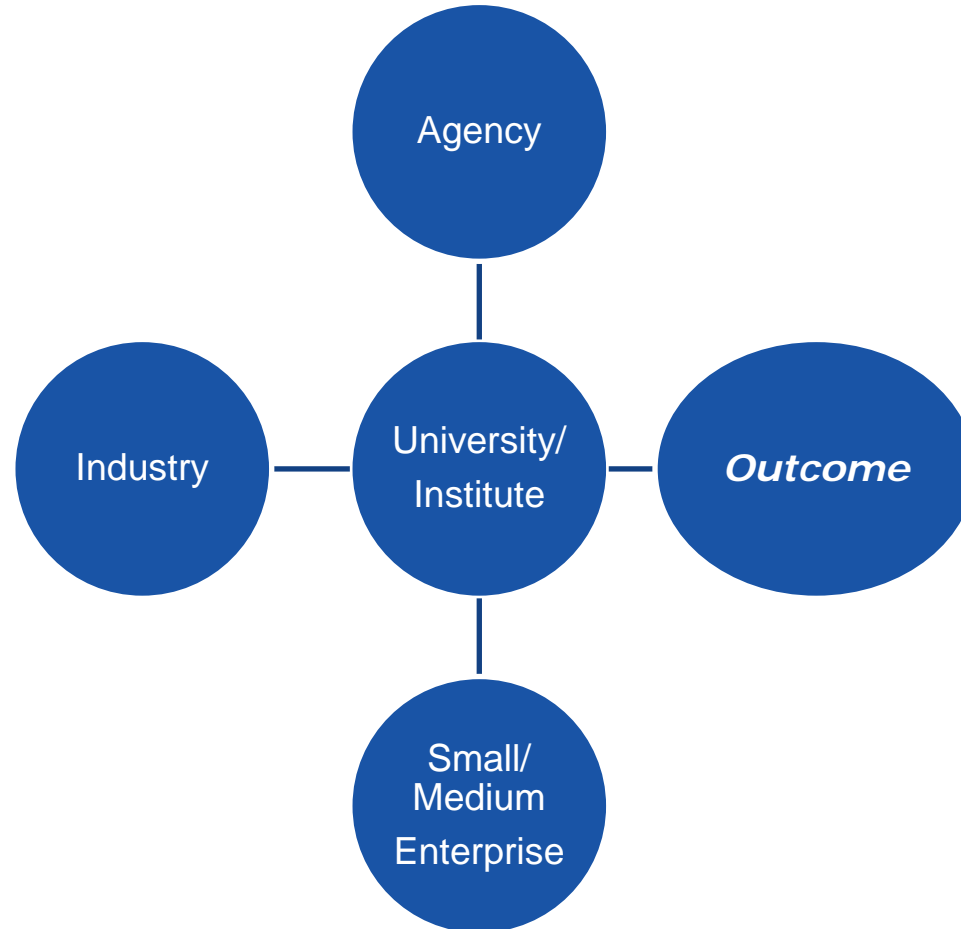
ROUNDTABLE ON WATER
Water Management that
Makes Business Sense

24 January @ 10am

SIBC Thematic Roundtables



Partnerships for Business development for Safe Drinking Water Supplies



Receive with
folded hands
blessings from
mother earth.

वर्षा जल अमूल्य है,
एक स्वस्थ जीवन हेतु
इसे पुनर्भरण द्वारा
संरक्षित करें.



Central Ground Water
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THANK YOU!

