EVENT REPORT

LOT 2: Rural Water and Food Security (PI RURAL)

ACTIVITY	2		SUB-ACTIVITY		2.4	
EVENT	**Groundwater Quality Management Policy Dialogue Webinar**					
EVENT INFO	DATE 26 & 28 October 2021		LOCATION On-line		PARTICIPANTS 68	
TYPE	Exchange Visit or Study Tour	Business mission	Technical meeting	Conference Workshop Seminar	Training	Outreach Advocacy
				X		
PARTICIPANTS	See Attachment 1					

DESCRIPTION

The PI RURAL Groundwater Quality Management Webinar was executed by the PI RURAL lead partners, i.e., the Geological Survey of Denmark and Greenland (GEUS) and the International Economic and Technical Cooperation Exchange Centre (INTCE) and organised by China Resources Management (ChinaRM) responsible for the Groundwater Policy Dialogues.

The webinar attracted 68 participants, with a maximum of 58 participants on Day 1 and 48 participants on Day 2, including international organisations, government staff, university researchers and many students, experts from sector institutes, water utilities and the private sector (See Attachment 1).

In 5 sessions, with a total of 18 presentations, key groundwater quality management practices, challenges and opportunities were addressed including (See Attachment 2):

1. Status of Groundwater Quality in China and in the EU
2. Groundwater quality monitoring and legislation
3. Protection of Groundwater Quality
4. Mitigation of diffuse groundwater pollution
5. Remediation and treatment of polluted groundwater

The presentations were delivered by staff from 17 International, Chinese and European institutions.

International:

- European Environment Agency (EEA)
- International Water Management Institute (IWMI)

China:

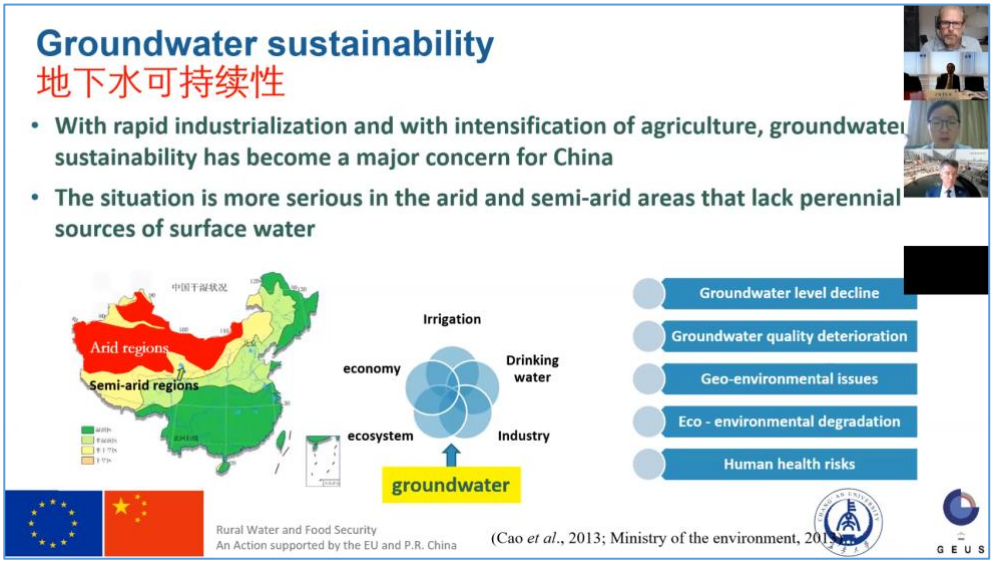
- Chang'an University (长安大学)
- China Agricultural University (CAU)
- China Geological Survey (CGS)
- Institute of Water Resources and Hydropower Research (IWHR)
- Ministry of Natural Resources (MNR)
- Ministry of Water Resources (MWR)

	• Nanjing Hydraulic Research Institute (NHRI) • Southern University of Science and Technology (SUSTech) • Water Research Institute of Shandong Province (WRISD) **EU:** • Aarhus Water • China Resources Management (ChinaRM) • Delft University of Technology • Finnish Environment Institute (SYKE) • Geological Survey of Denmark and Greenland (GEUS) • Technical University of Denmark (DTU) **Closing remarks:** Mr. Bjørn Kaare Jensen (GEUS) appreciated the high quality of all presentations, which had given a good and broad insight in the challenges and issues connected with use and protection of groundwater and expressed his admiration of the expansion of the groundwater monitoring system and the high level of technologies applied, before he concluded that *"we have learnt a lot and achieved what we came for"*. In his closing remarks Dr. Jin Hai (INTEC) stated that *"it has been a privilege to attend and chair this webinar"* and went on to summarise recent developments of groundwater management in China: 2017 China accelerated implementation of nationwide groundwater protection and utilisation planning 2019 Action Plan for protection of groundwater 2020 A nationwide groundwater monitoring network was established thanks to a collective effort of the Ministry of Water resources and the Ministry of Natural Resources 2021 State Council renewed and approved draft legislation on Groundwater Management establishing the legal basis for investigation, planning and protection of groundwater resources The timeline shows the appropriate timing and significance of PI RURAL and previous EU-China knowledge exchanges on groundwater management supported by the EU Technical Assistance and Information Exchange Facility (2015-16) and the EU Policy Dialogue Support Facility (2011-2014). The findings, results and recommendations of the webinar will be compiled in "Road to Recovery Part II - Groundwater Quality Management" and summarised in a policy brief to be presented at the 2022 CEWP High-Level Conference.
KEY TAKE HOME OBSERVATIONS:	1. Groundwater quality monitoring programs in the EU and China are converging with international best practice 2. Groundwater chemical status is good but has room for improvement in most rural areas of the EU and China 3. Groundwater monitoring programs should be risk based reflecting the local value of groundwater

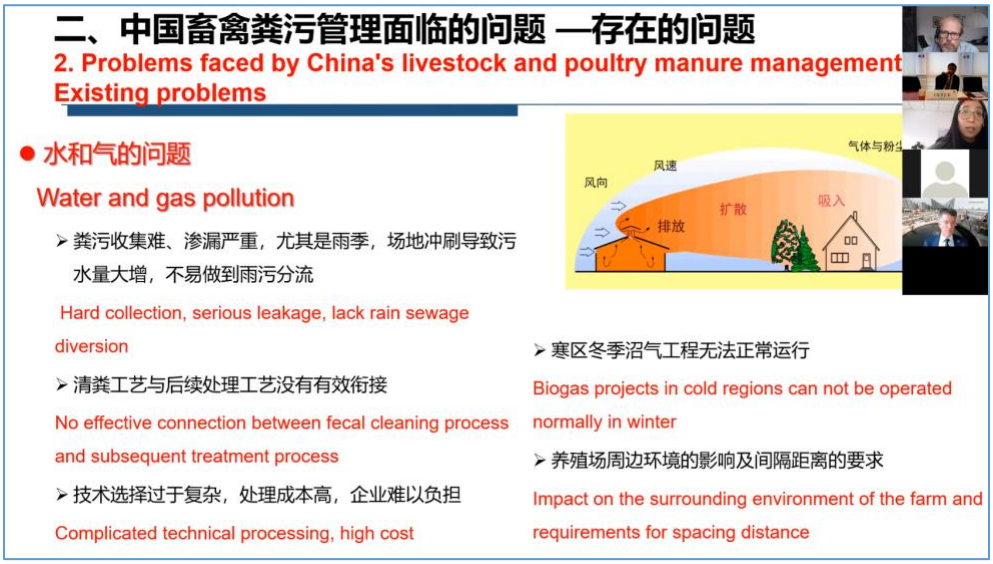
	4. Groundwater quality in rural areas is broadly at risk from anthropogenic pollution, i.e. diffuse agricultural pollution by nitrate, pesticides and biocides - and should be protected accordingly, e.g. cover crops and pesticide leaching assessment programs 5. Groundwater quality in rural areas is locally at risk due to: • "geogenic" pollution from equilibrium with aquifer host rocks (Fluorine) or saltwater intrusion in coastal areas (Chlorine and Iodine) • anthropogenic pollution due to overdraft causing from leaching of overlying rocks within depression cones (Arsenic) or upwelling of deep saline groundwater (Chlorine and Iodine) 6. Groundwater monitoring has high potential for digitisation and artificial intelligence for data collection and processing 7. Groundwater remains the main source for safe and affordable rural water supply 8. Groundwater-based rural water supply typically requires none or only basic treatment by aeration, sand filtration or chlorination 9. Permeable Reactive Barriers are applicable for local in-situ remediation of groundwater quality, e.g. as screens around groundwater abstraction wells 10. Managed Aquifer Recharge is increasingly applied to replenish groundwater aquifers and may also benefit groundwater quality owing to purification during infiltration
ATTACHMENTS:	1. List of Participants 2. Webinar Program
GROUP PHOTO:	

SAMPLE SLIDES:

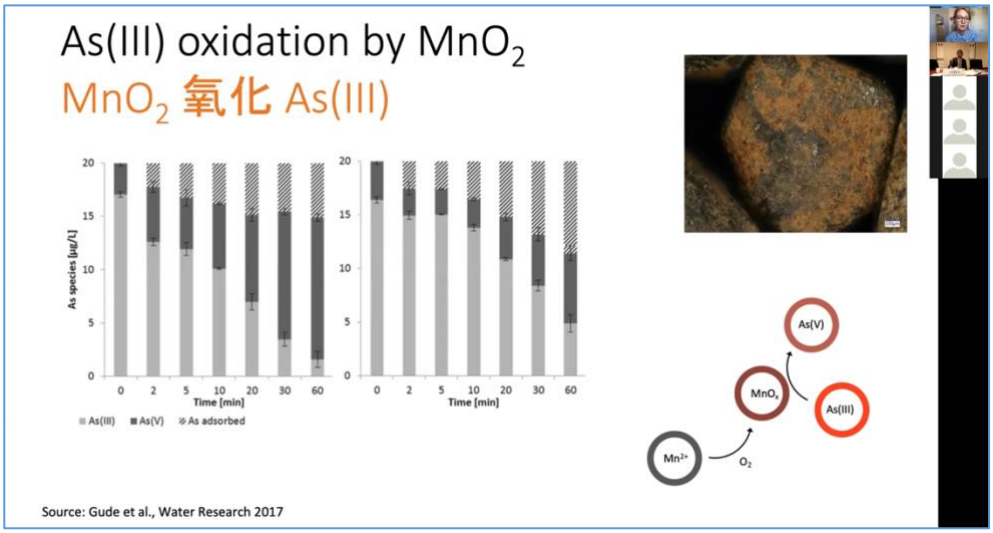
Groundwater quality standards supporting the objectives of the EU Groundwater Directive.
Ms Lærke Thorling Sørensen, GEUS.



Impact of irrigation on groundwater quality.
Dr Chen Jie, School of Water and Environment, Chang'an University.



Mitigation of diffuse agricultural pollution by livestock manure management.
Professor LU Haifeng, China Agricultural University



Removal of arsenic in groundwater for drinking water supply.
Dr. Doris van Halem, Delft University of Technology, Netherlands.

DESCRIBED BY:	Lars Skov Andersen China Resources Management 28 December 2021

ATTACHMENT 1

List of Participants

Name	Country	Company / Institute
CHEN Haoyang	China	
CHEN Huawei	China	Water Resources Research Institute of Shandong Province
CHEN Ying	China	MWR, CHINA
DAI Yunfeng	China	Nanjing Hydraulic Research Institute
FAN Mingyan	China	
GENG Niu	China	
GUO Wensi	China	SUSTECH
HE Xin	China	Institute of Water Resources and Hydropower Research
HOU Hai	China	
JIANG Aihua	China	Jinan Urban and Rural Water Authority
Jie Chen	China	Chang'an University
JIN Hai	China	INTCE
KANG Jie	China	Haihe Water Conservancy Commission (HWCC)
LI Fulin	China	Water Resources Research Institute of Shandong Province
LI Peiyue	China	Chang'an University
LI Shengpin	China	China Institute of Geo-Environment Monitoring (CIGEM)
LI Xue	China	Former Ministry of Environmental Protection now MNR or MEE
LIU Caihong	China	Water Resources Research Institute of Shandong Province
LIU Suxia	China	Institute of Geographic Sciences and Natural Resources Research
LU Haifeng	China	China Agricultural University
MA Jingjing	China	NORDiQ Engineering Consulting China
MA Meng	China	Institute of Water Resources and Hydropower Research
MA Yunjie	China	Southern University of Science and Technology (SUSTEC)
NN (APPLE)	China	
Portia Annabelle Opoku	China	Hohai University, Nanjing
SUN Feng	China	HMFC, MWR
SUN Yan	China	INTCE, MWR
TANG Liushan	China	Nanjing Hydraulic Research Institute
Tongtong	China	
WEN Dongguang	China	China Geological Survey
XU Jing	China	INTCE
YANG Waolei	China	
YAO Jingwei	China	Yellow River Institute of Hydraulic Research,YRCC
YGQ	China	
YIN Xiulan	China	China Institute of Geo-environment Monitoring
YU J J	China	
Zeu	China	
ZHANG Linruo	China	

Name	Country	Company / Institute
ZHANG Li	China	SSI Trans
ZHANG Zoe Ning	China	SSI Trans
ZHAO Yue	China	SSI Trans
ZHAO Qi	China	Water Resources Research Institute of Shandong Province
ZHENG Xiaogang	China	INTCE
ZHENG Yan	China	Southern University of Science and Technology (SUSTEC)
Anette Elisabeth Rosenbom	Denmark	GEUS
Bertel Nilsson	Denmark	GEUS
Bjarni Petjursson	Denmark	GEUS
Bjørn Kåre Jensen	Denmark	GEUS
Gitte Fogelberg	Denmark	GEUS
Hans Jørgen Henriksen	Denmark	GEUS
Hans-Jørgen Albrechtsen	Denmark	Technical University of Denmark, Department of Environment
Henrik Bregnhøj	Denmark	Good Deed Consulting
Jakob Lanstorp	Denmark	Environmental Protection Agency
Kiril Manevski	Denmark	Aarhus University
Lærke Thorling	Denmark	GEUS
Lars Schrøder	Denmark	Aarhus Vand A/S
Lars Skov Andersen	Denmark	China Resources Management
Ryle Gejl	Denmark	Environmental Protection Agency
Karen Villholth	International	International Water Management Institute
Peter Kristensen	International	European Environment Agency (Retired)
Marketta	Finland	Finnish Environment Institute
Mirjam Orvomaa	Finland	Finnish Environment Institute
Sirkku Tuominen	Finland	Finnish Environment Institute
Doris van Halem	Netherlands	Delft University of Technology
Almudena Ordóñez Alonso	Spain	University of Oviedo
Emilio Custodio	Spain	Technical University of Catalonia UPC
Julio Berbel	Spain	Universidad de Córdoba
Adem BÜYÜKKÖPRÜ	Turkey	Ankara Büyüksehir Belediyesi ASKI Genel Müdürlügü
S. Sevinc Sengor	Turkey	Middle East Technical University
Helen Bray	UK	UK Environment Agency
Mark Whiteman	UK	UK Environment Agency

ATTACHMENT 2

Program

Rural Water and Food Security
An action supported by the European Union

PI RURAL Dialogue Seminar

Best Practices in Groundwater Quality Management

2-day PI RURAL Webinar

Tuesday 26 and Thursday 28 October

Time: 09:00 – 12:00 CET / 15:00 – 18:00 CNT

The webinar will be held by Zoom and have simultaneous translation into Chinese and English.

Day 1 Groundwater Management

Chair: **Mr Bjørn Kaare Jensen, Geological Survey of Denmark and Greenland**

1 Opening and Logistics

Logistics Mr Bjørn Kaare Jensen, Geological Survey of Denmark and Greenland

Welcome Ms Xu Jing, Department of International Cooperation, MWR

2 Status of Groundwater Quality

Global Perspectives of Assessment of Groundwater Quality: Importance, Methods and Potential. Dr. Karen Grothe Villholth, International Water Management Institute on behalf of Friends of Groundwater. Contact: K.Villholth@cgiar.org.

Status of groundwater quality in Northwest China. Professor LI Peiyue, School of Water and Environment, Chang'an University. Contact: peiyueli@chd.edu.cn.

Groundwater quality in the European Union. Mr Peter Kristensen, European Environment Agency (Emeritus). Contact: peter_dmu@hotmail.com.

The Rural Water and Food Security Dialogue Seminars. Mr. Lars Skov Andersen, China Resources Management. Contact: ChinaRM@mail.dk.

3 Break

4 Groundwater quality monitoring and legislation

China's Groundwater Monitoring Network. Dr. Li Shengpin, Ministry of Natural Resources. Contact: shengpin1988@163.com.

Groundwater quality monitoring in the EU. Dr. Mirjam Orvomaa, Finnish Environment Institute. Contact: Mirjam.Orvomaa@ymparisto.fi.

Lars Skov Andersen
DK Mobile: +45 26136263
Mail: ChinaRM@mail.dk

ChinaRM
China Resources Management

Groundwater quality standards in China. Dr. WEN Dongguang, Center for Hydrogeology and Environmental Geology Survey (CHEGS), China Geological Survey.
Contact: wdongguang@mail.cgs.gov.cn.

Groundwater quality standards supporting the objectives of the EU Groundwater Directive. Ms Lærke Thorling Sørensen, GEUS. Contact: lts@geus.dk.

Closure. Chairs

Day 2: Groundwater Protection and Use

Chair: **Dr Jin Hai, MWR INTEC**

1 Protection of Groundwater Quality

Program and financing of protection of the groundwater catchment for Aarhus Water Supply. Director Lars Schrøder, Aarhus Water Supply. Contact: lars.schroder@aarhusvand.dk.

Impact of irrigation on groundwater quality. Dr Chen Jie, School of Water and Environment, Chang'an University. Contact: chenjie0705@gmail.com.

Pesticide Leaching Assessment Program for risk assessment of pesticides used in agriculture. Annette Elisabeth Rosenbom, Geological Survey of Denmark and Greenland. Contact: aer@geus.dk.

2 Break

3 Mitigation of diffuse groundwater pollution

Mitigation of diffuse agricultural pollution by livestock manure management. Professor LU Haifeng, China Agricultural University. Contact: haifenglu@cau.edu.cn.

Managed Aquifer Recharge - Degradation of sulfamethoxazole revealed by simulation of a push-pull experiment in a shallow aquifer of North China Plain. Dr. MA Meng, Institute of Water Resources and Hydropower Research. Contact: mameng526@hotmail.com.

Impact of saltwater intrusion caused by sea level rise. Dr. DAI Yunfeng, Nanjing Hydraulic Research Institute. Contact: yfdai@nhri.cn.

4 Break

5 Remediation and treatment of polluted groundwater

In-situ remediation of groundwater pollution by permeable reactive barriers. Professor Li Fulin, Water Research Institute of Shandong Province. Contact: fulinli@126.com.

Removal of ammonium and pesticides in groundwater-based rural water supply. Professor Hans-Jørgen Albrechtsen, Technical University of Denmark. Contact: hana@env.dtu.dk

Global Threat of Groundwater Arsenic: A Silent Public Health Crisis. Dr. ZHENG Yan, Southern University of Science and Technology (SUSTEC). Contact: zhengyan@sustech.edu.cn.

Removal of arsenic in groundwater for drinking water supply. Dr. Doris van Halem, Delft University of Technology, Netherlands. Contact: D.vanHalem@tudelft.nl.

6 Closure (11:50 – 12:00)

Take home lessons for the EU. Mr. Bjørn Kaare Jensen, PI RURAL Manager, Geological Survey of Denmark and Greenland.

Take home lessons for China. Dr. Jin Hai, Director, MWR International Economic and Technical Cooperation Exchange Centre.