



MINISTRY OF ENVIRONMENT AND TOURISM



# 24th IHP-Regional Steering Committee Meeting

in conjunction with

## The international and national water dialogue on the delivery of SDG 6 in Mongolia and wider Asia and the Pacific region

24-26 October 2016, Ulaanbaatar, Mongolia



Organised by

UNESCO Regional Sciences Bureau for Asia and the Pacific, IHP-RSC SEAP Secretariat  
Mongolian National Commission for UNESCO  
Ministry of Environment and Tourism of Mongolia  
with the support of UNESCO Japanese Funds-in-Trust

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## 24<sup>th</sup> IHP-Regional Steering Committee Meeting

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### The international and national water dialogue on the delivery of SDG 6 in Mongolia and wider Asia and the Pacific region

24-26 October 2016, Ulaanbaatar, Mongolia

#### Background

The International Hydrological Programme has entered the second year of its eighth phase (2014-2021) focusing on “**Water security: Responses to local, regional, and global challenges**” with the definition “the capacity of a population to safeguard access to adequate quantities of water of acceptable quality for sustaining human and ecosystem health on a watershed basis, and to ensure efficient protection of life and property against water related hazards -- floods, landslides, land subsidence,) and droughts” (UNESCO, Nairobi 2014). In Asia and the Pacific region, coordination mechanisms and implementation of the programme has been supported actively through the IHP Regional Steering Committee (RSC) established in 1993 and counting currently 17 IHP National Committees members and Category 2 water centres from the region, meeting every year with the strong support of the Japan Funds in Trust (JFIT, MEXT).

In cooperation with UNESCO office Jakarta and the participating member states, the RSC has co-ordinated a wide range of initiatives over ten years so far, including research studies, technical projects, workshops, training courses and annual symposia, bringing together many specialists involved in water related activities. The most notable regional initiatives made possible by the co-operative efforts of the RSC are: the AP-FRIEND (Asian Pacific Flow Regimes from International and Experimental Network Data) project, the Asian Pacific Water Archive and the Catalogue of Rivers.

The realization of Agenda 2030 and especially SDGs related to water directly Goal 6, Goal 14 or indirectly like Goal 2, Goal 3, Goal 12, Goal 13, Goal 15 and even Goal 16 with the role of water in many conflicts, require to solve key water-related issues from its management, its efficient use to reducing water-related disaster risk. Hence, UNESCO, IHP-RSC and Mongolia Ministry of Environment and Tourism will identify the most relevant issues for Mongolia and Asia and the Pacific region.

#### Objectives

The key objectives of this event are:

- 1) 24<sup>th</sup> IHP-RSC meeting conduction in order to coordinate and enhance scientific and educational collaboration between RSC members
- 2) Showcasing state of the art research and application of research in the field of water security in arid environment
- 3) Integrating UNESCO Natural Sciences initiatives (IHP, MAB and IGCP) in Mongolia and for the region
- 4) Scoping Mongolia and UNESCO joint programme on delivering SDG 6 in Mongolia and wider Asia and the Pacific region

#### Conference venue:

Hotel Kempinski

<https://www.kempinski.com/en/ulaanbaatar/hotel-khan-palace>

Kempinski Hotel Khan Palace Ulaanbaatar,

East Cross Road Peace Avenue Ulaanbaatar

Mongolia





**24th IHP-Regional Steering Committee Meeting**  
 in conjunction with  
**The international and national water dialogue on the delivery of  
 SDG 6 in Mongolia and wider Asia and the Pacific region**

**Tentative agenda of the 24th meeting of the IHP-RSC**

(24<sup>th</sup> October 2016, Ulaanbaatar, Mongolia)

*Venue: Kempinski hotel*

Time	Nr.	Agenda item	Responsible person
<b>23 October 2016</b>		Arrival of international participants	Pick up service will be arranged by the Organizers
<b>Day 1 –24 October 2016</b>			
<b>24<sup>th</sup> IHP-Regional Steering Committee South East Asia Pacific meeting</b>			
8:30-9:00	0	Registration	
9:00-9:10	1	Welcome and opening remarks	G.Nyamdavaa, Chairperson, Mongolian National IHP Committee and Director-General of the Department of Land Management and Integrated Water Resources Policy and Regulation, the Ministry of Environment and Tourism, Mongolia
9:10-9:25	2	Opening comments on behalf of RSC and UNESCO	Prof Guillermo Tabios, RSC Chairperson Prof Yasuto Tachikawa, RSC Secretary Prof Shahbaz Khan, RSC Secretariat
9:25-9:40	3	Adoption of the Agenda	Prof Guillermo Tabios, Chairperson
9:40-9:55	4	Secretariat report	RSC Secretariat
9:55-10:10	5	Report of IGC Bureau	Prof Ian White, former IGC Vice-Chair and Prof Yasuto Tachikawa, IGC Vice-Chair
10:10-10:40	6	Country Reports (4min max) part 1	IHP delegates
10:40-10:55		Coffee break	
10:55-11:25	7	Country Reports (4min max) part 2	IHP delegates
11:25-11:55	8	Updates from the centres under the auspices of UNESCO in the Asia Pacific Region	Category 2 centres
11:55-12:10	9	Report of the 7 <sup>th</sup> International Conference on Water Resources and Environment Research (ICWRER2016), 5-9 June 2016 in Kyoto, Japan	Prof Guillermo Tabios, Prof Yasuto Tachikawa
12:10-12:15	10	26 <sup>th</sup> IHP Nagoya Training Course	Prof Yasuto Tachikawa



12:15-13:45		Lunch break	
13:45-14:15	11	Post- Catalogue of Rivers Initiative: Updates on Catalogue of Hydrologic Analysis modules	Prof Hidetaka Chikamori and Prof Kenichiro Kobayashi
14:15-14:30	12	Organization of the 25 <sup>th</sup> RSC meeting in xxxx and associated conference	RSC Secretariat
14:30-14:45	13	Organization of the 26 <sup>th</sup> RSC meeting in xxxx and associated conference	IHP delegates, RSC Secretariat
14:45-15:00	14	Election of RSC Secretary	IHP delegates
15:00-15:15	15	Any other issues	IHP delegates
15:15-15:30	16	Adoption of Resolutions	IHP delegates
15:30-15:40	17	Closing of the Meeting	Prof Guillermo Tabios, RSC Chairperson
15:40-16:00		Coffee break	
19:00		Dinner	

**Note: Possible draft resolutions should be submitted to the RSC Secretariat by 14 October 2016.**



**24th IHP-Regional Steering Committee Meeting**  
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**Tentative Programme: International and national water dialogue on the delivery of SDG 6  
 in Mongolia and wider Asia and the Pacific region**

(25<sup>th</sup> October 2016, Ulaanbaatar, Mongolia)

**Venue:** Kempinski hotel

8:00-8:30	0	Registration	
	<b>1</b>	<b>OPENING SESSION</b>	
8:30-8:40	1.1	Opening remarks	UNESCO Regional Science Bureau for Asia and the Pacific, Prof Shahbaz Khan
	2.2	Opening speech	HE Ts. Tsengel, State secretary of the Ministry of Environment and Tourism of Mongolia
	<b>2</b>	<b>TECHINICAL SESSIONS: DELIVERY OF SGD 6 IN MONGOLIA AND WIDER ASIA AND THE PACIFIC REGION</b>	
	<b>2.1</b>	<b>International session 1: Water Security in Arid Environment</b>	
8:40-9:00		Keynote address on UNESCO's key water issues	Prof Shahbaz Khan, UNESCO Regional Science Bureau for Asia and the Pacific
9:00-9:20		Keynote address on Water problems in Mongolia	Sh. Myagmar, Director of the Division of Water resource, the Ministry of Environment and Tourism, Mongolia
9:20-9:40		Keynote 2: "Summary of UNESCO-Chair Program on Sustainable Groundwater Management in Mongolia: Toward a Standard of Water Governance Considering Groundwater / Surface Water Interaction in Semi-arid Regions"	Prof Maki Tsujimura - UNESCO Chair on Sustainable Groundwater Management and University of Tsukuba, Japan
9:40-10:00		Keynote 3: Using IWRM for better infrastructure: case study from Canterbury	Dennis Jamieson - Project Leader - Water Infrastructure Environment Canterbury
10:00-10:15		Coffee break	
10:15-10:45		Panellists' presentation (5 panellists, 5min each) - Prof Tachikawa Kyoto University, Japan - Prof Ulrich Looser, GRDC, Germany - Dr Z. Batjargal, Special envoy of Climate change, and a former Minister of Environment, Mongolia - Dr P. Batima, Coordinator of Mongolian water forum, Mongolia - Dr D. Basandorj, CWP Mongolia/GWP, Mongolia	
10:45-11:00		Panel Discussion on "Water Security in arid environment" moderated by Prof Ian White, USP (5 panellists)	





	<b>2.2</b>	<b>International session 2: Integrated UNESCO initiatives in Water and Environment</b>	
11:00-11:15		Keynote 1: Geopark as a model for environmental sustainability	Prof Ibrahim Komoo, UKM, Malaysia, Chair Asia Pacific Geoparks Network
11:15-11:35		Keynote 2: Biosphere reserve, a model for sustainable environmental management	
11:15-11:25		2.1) MAB Activities in Japan and collaboration between MAB and IHP	Prof Tachikawa (representing MAB Japan)
11:25-11:35		2.2) The Management and challenges of the Biosphere reserves of Mongolia	Ch. Batsansar, Head of the Mongolian National MAB Committee and Director-General of the Protected Areas Administration Department
11:35-11:50		Keynote 3: IWRM Implementation for Water Security under SDG6	Prof Soontak Lee - Distinguished Professor, Yeungnam University President, International Hydrologic Environmental Society (IHES) Governor, World Water Council (WWC)
11:50-12:30		<p>Panel Discussion on “Water security for a better life: Water in a healthy, productive environment and ecosystems”(synergy of IHP with other UNESCO Natural Science Programme MAB and IGGP in AP region) moderated by Prof Takara, Kyoto University, Japan</p> <ul style="list-style-type: none"> <li>- Prof Ibrahim Komoo, UKM, Malaysia</li> <li>- Prof Tachikawa, Kyoto University, Japan</li> <li>- Ch. Batsansar, Head of the Mongolian National MAB Committee and Director-General of the Protected Areas Administration Department, Mongolia</li> <li>- Prof Soontak Lee, Distinguished Professor, Yeungnam University, President, International Hydrologic Environmental Society (IHES), Governor, World Water Council (WWC), Republic of Korea</li> <li>- Dr Md Nasir bin Md Noh, Malaysia</li> <li>- Prof Ts. Adiyasuren, Advisor of the Minister of Environment and Tourism, and a former Minister of Environment, Mongolia</li> <li>- Prof Takeuchi, ICHARM, Japan</li> </ul>	
12:30-13:30		Lunch break	
	<b>2.3</b>	<b>Mongolian perspectives on water security</b>	
13:30-13:50		Climate change impacts on water resources and adaption measures in Mongolia	Dr Davaa.G, Head of Hydrological Sector, Institute of Hydrology and Meteorology
13:50-14:10		Hydrogeological mapping and ground water resources development and arid environment of Mongolia	Dr Jadambaa.N, Geological Survey Centre



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14:10-14:30		Water supply management, challenges and priorities	Dr Janchivdorj.L, Head of Sector for Water Resources and Water Resources Utilization, Institute of Geography and Geoecology, Mongolia
14:30-14:50		Q&A All participants	
14:50-15:05		Coffee break	
	<b>3</b>	<b>DIALOGUE</b>	
15:05-16:05	3.1	Dialogue/group discussions (2-3 groups) on scoping Mongolian and UNESCO joint programme on delivering SDG 6 in Mongolia and wider Asia and the Pacific region All participants	
16:05-16:20	3.2	Presentation from each group (5min per group) All participants	
	<b>4</b>	<b>CLOSING SESSION</b>	
16:20-16:40		Presentation of the Mongolia/UNESCO synthesis on delivering SDG 6 in Mongolia and wider Asia and the Pacific region	Prof Shahbaz Khan, UNESCO Regional Science Bureau for Asia and the Pacific
16:40-17:20		Closing remarks	H.E. Tsengel.Ts, State secretary of the Ministry of Environment and Tourism
			IHP RSC
			Prof Shahbaz Khan, Director of UNESCO Regional Science Bureau for Asia and the Pacific
19:00	5	Dinner	Dinner hosted by H.E. Tsengel.Ts, State secretary of the Ministry of Environment and Tourism





### Tentative programme of the field trip

26<sup>th</sup> October 2016, Ulaanbaatar, Mongolia

	Time	ARRANGEMENT
<b>26<sup>th</sup> OCTOBER (WEDNESDAY)</b>	10:00-10:50	Depart from hotel and travel to upper drinking water sources of Ulaanbaatar city /20km/
	10:50-11:40	Visit to upper drinking water sources of Ulaanbaatar city
	11:40-12:30	Travel to the Tsonjin boldog complex /35km/ (The statue of Genghis Khan is 40m high (131 feet), made of stainless steel and was erected in 2008).
	12:30-13:30	Visit of museum at the Tsonjinboldog complex
	13:35-14:40	Lunch
	14:40-15:00	Travel to the crossing point of the Arctic basin, the Pacific basin and the Central Asian basin without external flow. Khundlunuul is located in Erdene sub province of Tuv province. /25km/
	15:00-16:30	Hike up to the Khundlun mountain /about 2-3km/
	16:30-18:00	Travel back to the Ulaanbaatar city
	19:00	Dinner
<b>27<sup>th</sup> OCTOBER (THURSDAY)</b>	<b>Departure</b> (Drop off service will be arranged by the organizers)	



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**Proceedings for the International and national water dialogue on the delivery of SDG 6 in Mongolia and wider Asia and the Pacific region**

**TECHNICAL SESSIONS: DELIVERY OF SDG 6 IN MONGOLIA AND  
WIDER ASIA AND THE PACIFIC REGION**

**Keynote address on UNESCO's key water issues in Asia and the Pacific**



**Prof SHAHBAZ KHAN**

Director and Representative, UNESCO Regional Science Bureau for Asia and the Pacific

Professor Shahbaz Khan (Australia) holds a Bachelor of Science (Honours) in Civil Engineering (1990) from the University of Engineering and Technology, Lahore (Pakistan); a Master of Science in Water Resources Technology and Management (1992) and a Doctorate in Civil Engineering (1995) from the University of Birmingham (United Kingdom); Graduate Diploma in Applied Geographic Information Science (2001) and a Grad Certificate in Information Technology (2003) from the Charles Stuart University in WaggaWagga (Australia). In 2005, Shahbaz obtained a Master's Degree in International Environmental Law from the Macquarie University (Australia) and in 2007 a Master's Degree in Applied Environmental Economics from the Imperial College London (United Kingdom). Shahbaz is a Fellow of the Institution of Engineers Australia, Hon Fellow of the Myanmar Engineering Society and Fellow of the Modelling and Simulation Society of Australia and New Zealand. Shahbaz is also a chartered engineer and engineering executive of Engineers Australia and was awarded Federation of Engineering Institutions in Asia and the Pacific (FEIAP) Engineer of the Year for 2016. Shahbaz is currently Adjunct Professor at the University of Canberra, Australia and Distinguished Professor at the National University of Science and Technology, Pakistan.

**Abstract**

**UNESCO's key water issues in Asia and the Pacific**

Asia is one of the region hardest hit by natural hazards and in which the vast populations settled in both urban and rural coastal areas are particularly vulnerable. Early warning systems, preparedness plans, and climate change adaptation and mitigation are necessary to reduce risk and the additional measures must be taken to address underlying vulnerabilities.

Healthy ecosystems such as coastal ecosystems and associated watersheds provide a wide range of services to coastal communities, including food provision, natural shoreline protection against storms and floods and flood regulation among others. These services are fundamental to building community resilience to coastal hazards.

Therefore, having better understanding and further development of guidelines, monitoring networks and databases as well as prediction of changes of groundwater, floods and droughts are crucial to identify the types and magnitude of changes in the coastal areas as the great challenge in Asia and Pacific.



## International session 1: Water Security in Arid Environment

### Keynote address on Water problems in Mongolia



#### Mr. MYAGMAR SHAR

Director, Division of Water Resources

Mr. MyagmarShar has been working at the Ministry of Environment and Tourism since August 2016 as a Director of the Division of Water Resources. The main activities of the Division of Water Resources are coordinating all activities in protection, proper utilization, restoration of water resources of the country and providing professional guidance and management for prevention of water pollution and reuse and recycle of water resources.

He is a geologist, obtained MSc in technics in 1999 and graduated from Academy of Public Administration as business administration.

His professional career as a geologist started in geology expedition of Dornod in 1986. He has served in the field for over 10 years. In the years of 1996-2005, he worked as a director of "Gan-motors" company. His career serving for the government has started since 2005. He has worked in a water agency as an officer, as Director of Division from 2005 to 2012. He also worked as a Director of Division for water management and planning.

#### Abstract

##### Policy on water sector of Mongolia and addressing issues

According to the studies conducted over the past 40 years, total surface water resources of Mongolia have been estimated as 600.000 million m and total annual water use and consumption were estimated as 500 million m. It is also predicted that the total annual water consumption will be increasing more due to population and economic growth.

The fundamental strategy of the water policy is to implement river basin management at all level in protection, use and restoration of water resources as indicated in the Law on Water. Moreover, it is stated in the National sustainable development framework-2030 that not less than 50% of the total areas of head of rivers shall be taken by the national protection. By 2016, 44.5% of the total area of river heads has already been secured under the national protection.

Main challenges in water sector of Mongolia are securing adequate and acceptable amount of drinking water for all by increasing use of surface water, protecting rivers from pollution, renovating and enlarging waste water treatment plants, providing constant monitoring on water use, consumption and water quality, increasing survey of groundwater resources for supplementary sources of water for all sectors and increasing capacity building.

Mongolia is one of the country that has a risk of water stress due to continuation of melting down of permafrost and glaciers impacted by the climate change. Therefore, it is most important to increase surface water use by contracting reservoirs and accumulating river water.





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**Keynote 2: Summary of UNESCO-Chair Program on Sustainable Groundwater  
Management in Mongolia: Toward a Standard of Water Governance Considering  
Groundwater / Surface Water Interaction in Semi-arid Regions**



**PROF MAKI TSUJIMURA -**

*Professor in Hydrology and Water Resources,  
Faculty of Life and Environmental Sciences, University of Tsukuba, Japan  
Vice President, International Commission on Tracer, International Association of  
Hydrological Sciences  
Co-Chair, UNESCO Chair on Sustainable Groundwater Management in Mongolia*

Dr. Tsujimura's area of expertise is groundwater and surface water hydrology using the integrated approaches of isotope / gas tracers and hydrometric measurements, and he recently has experienced field researches in the warm humid and semi-arid regions of China, Thailand, Vietnam, Mongolia and Tunisia. Also, he performs intensive investigation on groundwater / spring water residence time and subsurface water storage at headwater catchments in Japan.

**Abstract**

Summary of UNESCO-Chair Program on Sustainable Groundwater Management in Mongolia: Toward a Standard of Water Governance Considering Groundwater / Surface Water Interaction in Semi-arid Regions

We are going to present activities of UNESCO Chair in Mongolia focusing on hydrological processes investigation of groundwater / surface water interaction revealed by multi-tracer approach and hydrogeological data analysis in Ulaanbaatar, Capital City, Mongolia, showing that the groundwater which is a major source of drinking water in Ulaanbaatar is dominantly recharged by river water throughout a year. We will also present some outcomes of field research experiences on groundwater recharge processes in semi-arid regions, Tunisia, showing that reservoir water makes an important role in recharging the groundwater and regulating the sea water intrusion in coastal area.

Finally, we would like to propose an idea and discuss on integrated water governance in semi-arid regions based on these experiences to suggest a better scheme of a community on the water governance consisting of multiple stakeholders.



### **Keynote 3: Using IWRM for better infrastructure: case study from Canterbury**



**Mr DENNIS JAMIESON**

Canterbury Regional Council (Environment Canterbury) New Zealand

Career has focussed on the application of research results, the identification of information needs for better water management and innovative approaches to deliver outcomes.

Qualifications in Engineering and Business Administration

Interests and expertise are focussed on better practices for water infrastructure. The incorporation of good practice water management approaches as incorporated in IHP-VIII are an essential component of ensuring productive investment of billions of dollars of private and public infrastructure investment.

#### **Abstract**

#### **Using IWRM for better infrastructure: Case study from Canterbury**

Canterbury is a 45,000km<sup>2</sup> region located on the east coast of the South Island of New Zealand. The region has an abundant water supply in seven major rivers flowing from mountains in the west. However historic practices led to heavy abstraction of groundwater and smaller rivers flowing from the foothills of the mountains in the west for irrigation. Since 2010 a major regional initiative (Canterbury Water Management Strategy (CWMS) has been in place with an important role in reducing abstractions from smaller water resources and assisting a switch to abstractions from the major rivers. The CWMS has used a multi-target participatory process that is a locally customised example of Integrated Water Resource Management (IWRM). This is notable as an important guiding set of principles have been provided by a major central government programme since 2008 to improve infrastructure practices across New Zealand. The alignment of the IHP focus on IWRM, including the role of Ecohydrology, are an indication of the importance of converging good practices in both infrastructure and water management.





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**International session 2 : Integrated UNESCO initiatives in Water and Environment**

**Keynote 1: Geopark as a model for environmental sustainability**



**PROF IBRAHIM KOMOO**, PhD, FIGM, FASc, DSNS, is Principle Research Fellow at Institute for Environment and Development, Universiti Kebangsaan Malaysia and Principle Fellow of LESTARI UKM. He graduated from Universiti Kebangsaan Malaysia (UKM) in 1976 and obtained his PhD from Strathclyde University, Glasgow in 1979. He has held various management positions in Universiti Kebangsaan Malaysia (UKM): Head, Department of Geology; Director, Institute for Environment and Development (LESTARI UKM), (1998-2000 and 2001-2005); Deputy Vice Chancellor (Research and Innovation), Universiti Kebangsaan Malaysia (2005 - 2008); Founder Director/ Chair of Southeast Asia Disaster Prevention Research Institute (SEADPRI-UKM) (2008-2012)(2015-2016); Special Advisor to Minister of Higher Education, Malaysia (2011-2013); and Vice Chancellor of Universiti Malaysia Terengganu (UMT) (2012-2015)

His fields of specialization include Engineering Geology (landslide; geohazards management); Environmental Geology (geoheritage conservation; geotourism; geopark); and Sustainability Science (environmental sustainability; regional sustainable development). As a scientist, he has published more than 50 books, and more than 330 scientific papers. He has also published numerous articles for public awareness in magazines and newspapers. He has served as Vice President, International Association for Engineering Geology (IAEG) (1998-2003); President, Geological Society of Malaysia (1998-2000); Vice President, Institute of Geology Malaysia (2000-2001) and Council Member, Academy of Sciences Malaysia (ASM) (2010-2012). Currently, he is Head of Natural Resources and Environment Cluster of the National Council of Professors (MPN); Vice President, Global Geoparks Network Association (GGN); Vice-Chair, UNESCO Global Geoparks Council; Council, UNESCO Global Geoparks; Expert/ Evaluator, UNESCO Global Geoparks; Coordinator, Asia Pacific Geoparks Network (APGN); and Advisor of Langkawi UNESCO Global Geopark.

He was appointed as Fellow, Institute of Geology, Malaysia (FIGM) (1995) and Fellow, Academy of Sciences, Malaysia (FASc) (2002). He received Darjah Dato Setia Negeri Sembilan (DSNS) conferred by the Sultan of Negeri Sembilan (2007), Langkawi Award (2009), Emeritus Professor UKM (2012), Science Excellence Award 2012 (Environmental Geology) from International Union of Geological Sciences (IUGS) (2013), Malaysia Geoscientist Award (2013); Honorary Member of Geological Society of Malaysia (GSM) (2014) and Langkawi Tourism Personality Award (2015).





## Abstract

### Geopark as a Model for Environmental Sustainability

Ibrahim Komoo

Vice Chair, UNESCO Global Geoparks Council

Vice President, Global Geoparks Network

And Advisor, Langkawi UNESCO Global Geopark

c/o Institute for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia

UNESCO Global Geoparks defines geopark as single, unified geographical areas where sites and landscapes of international geological significance are managed using a holistic concept of protection, education and sustainable development. Geopark uses geological heritage to connect with other aspects of the area's natural and cultural heritage. In essence, while allowing the current development is carried-out sustainably, geopark is a new management tool for sustainable development of the region, taking into consideration, how to balance heritage conservation, tourism activities and local community well-being. Furthermore, geopark also gives greater attention to sustainable utilization of natural resources, minimization of the risk of geological hazards and management of the impact of climate change through public education, scientific research and community empowerment. This paper will highlight specific programs and best practices on how geopark can be the model for environmental sustainability.

**Keywords:** geopark, geological heritage, integrated conservation, sustainable development, environmental sustainability.



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**Keynote 2: Biosphere reserve, a model for sustainable environmental management**

**2.1) MAB Activities in Japan and collaboration between MAB and IHP**



**PROF YASUTO TACHIKAWA**

Organisation: Department of Civil and Earth Resources Engineering, Kyoto University, Japan

Professional Profile:

Professor: October 2013-Present. Dept. of Civil and Earth Resources Eng., Kyoto University

Associate Professor: April 2007-October 2013. Dept. of Civil and Earth Resources Eng., Kyoto University

Associate Professor: April 1996-March 2007. Disaster Prevention Research Institute, Kyoto University, Japan

Research Associate: September 1990-March 1996 Dept. of Civil Eng., Kyoto University, Japan

Academic Background: Hydrology and Water Resources Engineering

Interest and Expertise: Rainfall runoff modelling; space-time modelling of hydrologic processes; real-time flood forecasting; hydrologic predictions in ungauged basins, uncertainty analysis in hydrological prediction; flood disaster reduction.

**Abstract**

**MAB activities in Japan and collaboration between MAB and IHP**

Japanese National Committee for MAB, Man and the Biosphere is established under Japanese National Commission for UNESCO. The Committee consists of researchers of various fields in environmental sciences as well as experts in fields other than environment. The roles of the national committee include: screening of national nominations of BRs, Biosphere Reserves; setting standards for establishment and management of BRs; and deliberation of activities relating to MAB. Seven areas in Japan are approved as BRs of MAB Programme. In the BRs, a society model which realizes the sustainable use of natural resources and conservation of ecosystem at the same time is studied in local communities by sharing experiences and knowledge between the existing BRs. The hydrologic cycle and water resources also have close relationship with human life and ecosystem. Under climate change conditions, many research and education topics under MAB overlap IHP-VIII. In the presentation, the MAB activities in Japan are briefly introduced and discuss collaboration between MAB and IHP.



## 2.2) The Management and challenges of the Biosphere reserves of Mongolia



### Mr. BATSANSAR CHILKHAAJAV

DIRECTOR-GENERAL, DEPARTMENT OF PROTECTED AREAS ADMINISTRATION

Mr. Batsansar is the Director-General of the Department of the Protected Areas Administration, Ministry of Environment and Tourism, Mongolia, since 2014. He is also the Head of the Mongolian National MAB Committee and a Member of the State secretary council at Ministry of Environment and Tourism, Mongolia.

His main duties are to specify general policy of the protected areas, to develop proposals for the improvement of the legal framework, to organize researches in order to cover more protected areas, to establish more protected areas administrations and to provide management and functionality.

He started at "TS B Nasa" LLC in 1996 as a manager. From 1997 to 2000 he worked as a manager at "Transgate" LLC. As he gained more experience, he promoted as a director at the Department of Human Resources at "BOSA" LLC from 2002 to 2004. From 2004 to 2009 his position was director of the "Global Most" LLC. From 2009 to 2012 he worked as a officer of the Department of Cadastral at the Mineral Resources Authority of Mongolia. From 2012 to 2014 he worked as a chairman of a company in private sector.

### Abstract

#### Biosphere Reserves of Mongolia

Mongolia is a landlocked country in Central Asia with extreme continental climate conditions and borders Russia to the North and China to the South. Since 1990 Mongolia has been actively involved in MAB program and its activities and registered 6 sites in the UNESCO's biosphere reserves network (Great Gobi, Bogd-Khan Uul BR, UvsNuur Basin BR, HustainNuruu BR, Dornod Mongol BR and the Mongol Daguur BR).

#### GREAT GOBI BIOSPHERE RESERVE

Trans Altai Gobi of the Altai is the unique ecosystem of the Gobi desert sustaining untouched natural state which is important habitat for endangered species of fauna and flora not only in Mongolia as well as in the World including mammals such as wild Bactrian camel, the Gobi bear, Asiatic wild ass, Argali wild sheep, Goitered gazelle and Siberian Ibex.

#### BOGD-KHAN UUL BIOSPHERE RESERVE

Bogd Khan Uul Biosphere Reserve is located in the south of Ulaanbaatar city, in the southern most forest steppe zone and in the Khentii Mountain area. The northern slopes of the mountains are covered by dense coniferous forest and the southern slopes by bare rocks. Among the most threatened animal species in the biosphere reserve are the Musk deer, Roe deer, Sable and Arctic hare. There are more than 500 different kinds of plant species, 47 species of mammals and 160 species of birds in the park.





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#### UVS LAKE BASIN BIOSPHERE RESERVE

UvsNuur Basin is located in the north-western part of Mongolia covering wide magnitude of areas in Great Lakes Depression and mountains belonging to Altai Mountain range. It is considered to be northern edge border of Central Asian desert area with unique ecological landscape, hence the area was taken under protection as an entire ecosystem.

#### HUSTAIN NURUU BIOSPHERE RESERVE

The Mongolian Government declared HustainNuruu Biosphere Reserve (HNBR) as a Specially Protected Area in 1993, one year after the initiation of the reintroduction project of the Takhi to the HustainNuruu. The HNBR extends through the Khentii Mountains and includes the western edge of the Mongolian steppe at the boundaries of Altanbulag, Argalant and BayankhangaiSoums of Tov province.

#### DORNOD MONGOL BIOSPHERE RESERVE

The biosphere reserve, situated in the eastern corner of Mongolia, is one of the largest intact grassland ecosystems in the world. It is situated on the Mongolian Plateau with an average altitude of about 800 meters above sea level. The main characteristic is rolling steppe, extending for over 200 kilometers along the Chinese border. The landscape is characterized by gently rolling hills with scattered mountains and sand dunes unique to the region. One of the main objectives of the BR is to preserve important spring, winter and autumn habitats of the Mongolian gazelle.

#### MONGOL DAGUUR BIOSPHERE RESERVE

The specific Mongol Daguur's steppe and wetlands territory represents mainly low-mountainous landscapes that support a variety of fauna and flora species. The Mongol Daguur biosphere reserve provides nesting and breeding grounds to globally endangered species i.e. White-naped Crane and there are many rare or critically threatened birds that use the steppe for migratory stopover sites.



### Keynote 3: IWRM Implementation for Water Security under SDG6



#### PROF SOONTAK LEE

Distinguished Professor, Yeungnam University

President, International Hydrologic Environmental Society (IHES), Governor, World Water Council (WWC)

Prof. Soontak Lee is presently a Distinguished Professor/Professor Emeritus of Hydrology and Water Resources Engineering of Yeungnam University, Korea, Governor of the World Water Council (WWC) and President of the International Hydrologic Environmental Society (IHES). He has been engaged as a Co-Chair of the International Steering Committee (ISC) of the 7th World Water Forum (WWF7) in Daegu-Gyeongbuk in 2015 and also as a Chairperson and President of the UNESCO IHP Intergovernmental Council and its Bureau from 2010 to 2012 and its Vice Chair for Asia Pacific Region as ex-officio from 2012 to 2014. He has extensive experiences in the field of hydrological sciences and water resources management and also served as Korean government representative to a number of water-related international conferences such as UN Water Conference, UNESCO, WMO, ESCAP and WWF. He obtained several Doctoral degrees, Ph.D., D.Sc. Hon.D.Eng.Sc. & Hon.Dr.Tech.Sc. from Korea University with Co-Program of the University of New South Wales, Australia, University of Tsukuba, Japan, Altai State Technical University, Russia Federation and University of Novi Sad, Serbia, respectively. He is currently publishing the Journal of Hydrologic Environment biannually as an Editor-in-Chief which is an official International Journal of the IHES and also published the UNESCO IHP HELP Programme Special Edition in Volume 7, Number 1, December 2011

#### Abstract

#### IWRM Implementation for Water Security under SDG6

Soontak LEE

Distinguished Professor, Yeungnam University, Republic of Korea

President, International Hydrologic Environmental Society (IHES)

Governor, World Water Council (WWC)

The Sustainable Development Goals (SDGs) was adopted as a set of goals to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development agenda by countries in 2015. Each goal has specific targets to be achieved over the next 15 years. Among these goals, the “water goal” SDG6 is to ensure availability and sustainable management of water and sanitation for all and centered as most important cross-cutting connector for most SDGs .

The achievement of the SDG6 is mainly to ensure the water security which is defined as the capacity of a population a) to ensure access to adequate quantities of water of acceptable quality for sustaining human and ecosystem health on a watershed basis, and b) to ensure efficient protection against water related hazards (floods and droughts). In this context, water security is an increasing concern arising from population growth, drought, floods, degradation of water quality, and climate change.



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In the SDG 6.5, it is proposed to implement the Integrated Water Resources Management(IWRM) at all levels, including through transboundary cooperation as appropriate by 2030 for the water security. The Integrated Water Resources Management(IWRM), a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems should be implemented for the global water management for water security through uses of IWRM guidelines, river basin approach and establishment of good understanding of sectoral perspectives.

It is essential to develop and implement IWRM and required to develop the IWRM strategies and establish the institutional framework and capacity building program. It is also expected to have effects such as contributing to preserve national water security and solve water problems by developing and applying an action plan for IWRM

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**Panel Discussion on “Water security for a better life: water in a healthy, Productive environment and ecosystems”(synergy of IHP with other UNESCO Natural Science Programme MAB and IGGP in AP region)**

**Panellist abstracts**



**PROF KUNIYOSHI TAKEUCHI**

Kuniyoshi Takeuchi is the advisor and the founding director of International Centre for Water Hazard and Risk Management (ICHARM) under the auspices of UNESCO, Tsukuba, Japan and professor emeritus of University of Yamanashi, Kofu, Japan. He got his BS, MS and Dr.Eng in civil engineering at University of Tokyo, and Ph.D in city and regional planning at University of North Carolina at Chapel Hill. He has been specialized in surface hydrology, water resource systems and disaster risk management. He served for various professional offices including Chairperson of UNESCO IHP Inter-Governmental Council and President of IAHS. He is a recipient of IAHS-UNESCO-WMO International Hydrology Prize (2012)

**Abstract**

**Transdisciplinary Approach for Building Societal Resilience to Disasters - Activities of ACECC TC21**

Asian Civil Engineering Coordination Council (ACECC) TC21 Transdisciplinary approach for building societal resilience to disasters was established in October 2015 to promote scientific knowledge based decision making in disaster management. In order to make such a decision making possible, transdisciplinary approach (TDA) is indispensable where scientists of all disciplines and stakeholders of all sectors work together to co-design and co-produce solutions and co-deliver and co-implement them to practice. This makes holistic and transformative change of society possible to build a resilient society. TDA is the way for society to go beyond the limit of knowledge and capacity that each discipline and sector alone or their partial cooperation can reach. Let us challenge for building societal resilience both by structural and non-structural means in TDA, a traditional form of achieving a difficult challenge in society.



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**DR. HJ. MD NASIR BIN MD NOH**

Deputy Director General 2 (Expert Sector)

Department of irrigation and Drainage, Kuala Lumpur, Malaysia

Work Experience: Serve with Department of Irrigation and Drainage Malaysia since 1989 till now

Previously the Director of Humid Tropics Centre Kuala Lumpur (a UNESCO Category 2 Centre dealing with Hydrology and Water Resources)

Technical Papers and publications:

20 international and 10 national in various topics covering sediment transport, river restorations, water quality improvements, erosion and sediment control, eco friendly drainage system and etc.

**Abstract**

Malaysia possible synergies between UNESCO programme

Dato Dr Mohd Nasir Bin Mohd Noh and Dr Asnor Muizan Bin Ishak  
(drasnorjps@gmail.com)

UNESCO-IHP Malaysia is an entity of the cooperation program between government agencies under UNESCO's membership of more than 40 Ministries, Departments and Institutions of Higher Learning related to water in Malaysia. Program established in 1975, led by the Department of Irrigation and Drainage Malaysia. The Malaysia IHP is to coordinate the investigation, research, practices, education, training and public information on hydrology and water resources, besides it is advising the government on the adoption of national water resources management. With that, MIHP suggesting a programme with UNESCO on the development of Water Balance Modelling with the expert from Disaster Prevention Research Institute, Kyoto University (Professor Kaoru Takara). The expected output from water balance study are Water Accounting, Water Availability, Demand Management Options, Water Allocation, Water Quality, Water Storing and releasing during high and low flows, Water Resources Index (WRI) and Drought Index (DI), Water Auditing. In addition to that, the outcome of this study is to provide 2 months forecast and 14 days warning to the water operator. Meanwhile the objectives are to exchange the modelling technique from Japanese Expert and enhance a knowledge on the rainfall forecast and water resources modeling. In conclusion, this study is a part of management tools for water manager which is adopted under the Integrated Water Resources Management.





## Mongolian perspectives on water security

### Keynote 1: Climate change impacts on water resources and adaptation measures in Mongolia



#### Dr GOMBO DAVAA

Dr.GomboDavaa, Head and Researcher, Information and Research Institute of Meteorology, Hydrology and Environment, MNET. He got Doc. Ph. degree in Hydrology, Feb.1996 at NUM. His main research areas are surface water monitoring, hydrology, surface water resources and glaciology.

He graduated from State University of Hydrology, Meteorology and Ecology, Sankt-Petersburg, Russia in 1984. His professional career started as lecturer in hydrology, Water economics college, Darkhan from July 1984 to June 1986. Then, he engaged as hydrological engineer at Experimental water balance study station, Darkhan from July 1986 to January 1991 and he was researcher in Surface water section, Institute of Meteorology, Hydrology from February to March 1991. Then he worked as researcher in Surface water division, Institute of Water policy, Ministry of Nature and Environment, from April 1991 to August 1993. He was science secretary of the Water Policy Institute from March 1996 to March 1997. Since April 1997, he is the Head of Hydrology section, Information and Research Institute of Meteorology, Hydrology and Environment. He was secretary of National Committee for UNESCO-IHP from 1996 to 2013.

#### Abstract

#### Climate change impacts on water resources and adaptation measures in Mongolia

G. Davaa, P.Gomboluudev, A.Batbold, D.Oyunbaatar, G.Oyunkhoo and B.Eredenebayar, Institute of Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE), Ulaanbaatar-46, Mongolia, E-mail: watersect@yahoo.com

Hydrological observation record, topographic map, remote sensing data and simulated and bias corrected Regional climate model data, simulated with WRF and RegCM4 have been used for analysis to reveal current changes in water and mass balance elements of rivers, lakes and glaciers.

ECHAM5 and HADGEM2 GCM's climate prediction results were downscaled with regional climate model RegCM4 with RCP8.5 GHG emission scenarios for the period of 2020, 2050 and 2080 developed by P.Gomboluudev, 2015 have been used for water balance model to reveal future climate change impact on water resources in Mongolia.

Statistically significant changes occur in dates of ice phenomena, ice cover and spring flood, flow regime and water temperature. Increase in lake area occurred mostly in large lakes, located in permafrost zone and fed by glacier melt waters. However, total lake area decreased by 1202 sq.km since 1940th till 2015. Due to decrease in areas, number of





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extremely small lakes has decreased by 1230 and accordingly number of temporal lakes (shaltoirom) has increased by 565. Totally, 832 lakes dried up in the period. Glacier area has decreased 29.9% in 1940th -2015 period and glacier melt intensified in last decades.

Results based on RegCM4-ECHAM5 show that significant increase in winter precipitation and slight increase in summer rainfall, air temperature increase in all seasons are projected. Consequently, drastic increase in evaporation from open surface water will impact on water resources, specially, negatively influence on water balance of lakes and river basins. Increase in air temperature most likely intensifies glacier melt and area of some selected glaciers will be decreasing by more than 40% by 2030 in comparisons with current. Current and possible future adaption measures are discussed for IWRM planning and implementation process.

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## Keynote 2: Hydrogeological mapping and ground water resources development and arid environment of Mongolia



**Dr. N. JADAMBAA**, Geological survey center, Ulaanbaatar, Mongolia

jadambaanamjil@yahoo.com

Now, Dr Jadambaa is a consultant and leader of hydro-geology group in Geological survey center which carries out geological, hydro-geological mapping in selected territory of Mongolia in every year, drills, conducts thematic studies in geology, tectonic, hydro-geology, geochemistry and geophysics.

He began his field hydro-geological first study in 1967 in Ulgiihiid. Tsagaantsav area is one of the arid regions of Mongolia. In this area fresh but mainly fossil groundwater resources deposit was discovered which is used in present time for agriculture and also middle yield artesian borehole. It is also used for livestock and wild animals since 1967.

Since 1968, N.Jadambaa takes part in compiling of different hydro-geological and environmental-hydro-geological mapping with scale of 1:50 000 to 1:1 000 000. He has his researcher interest in hydro-geological mapping, groundwater resources estimation in local area, aquifer systems of river valley and intermountain depressions, coal mining hydrogeology, environmental impact of mining industry and arsenal mining, and since 2008, integrated water resources management by water basins. During 1967-2016, N.Jadambaa published two monographs, two hydro-geological maps, many articles, abstracts and printed eight hydro-geological production reports about results of field studies jointly with different authors.

He obtained his PhD in 1977 and his Science Doctor in geology-mineralogy science in 1997 in Mongolia and Russia.

### Abstract

#### Hydro-geology Mapping and Groundwater Resources Development in Arid Environment of Mongolia

N. Jadambaa, B. Nyamaa, L. Munhtuyaa, B. Uuganhuu (Geological Survey Center, Mongolia)

Water security of Mongolia for the most part is depended from groundwater resources location. The hydro-geological study in arid environment of Mongolia is carried out in two main stages:

- 1) Hydro-geological mapping;
- 2) Groundwater resources prospecting and exploring.

1. Hydro-geological mapping has three sub-stages;

- 1.1) Regional hydro-geological small scale mapping: In 1939, first field hydro-geological mapping at scale 1:1 000 000 was started in steppe and desert area of Mongolia for the noble purpose to improve animal husbandry watering.



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1.2) In 1966, regional hydro-geological middle scale mapping was started. This field survey was finished at end of 1993. As a result of such small and middle scale field study were published hydro-geological maps: Hydro-geological map of MPR at scale 1:1500 000 [1973] and Hydro-geological map of Mongolia at scale 1:1000 000 [1996] and at scale 1:3 000 000 [2009].

1.3) Large scale hydro-geological mapping 1:10 000-1:25 000 on near territory of ore-bearing or coal-bearing areas and the Ulaanbaatar area 6000 km.

Complex geological-hydro-geological field mapping at scale 1:500 000 on the area 340 000 km<sup>2</sup> and hydro-geological field mapping at scale 1:100 000 - 1:200 000 of some desert area of the country - 210946 km<sup>2</sup> were drawn.

Not published map 1:500 000 and 1:200 000 for choosing territory of Mongolia [1981-1997], and also new hydrogeological map at scale 1:500 000 for all territory of Mongolia (2014-2017).

2. Groundwater Resources Development in Mongolia, including arid desert area

2.1) Hydro-geological, geophysical prospecting and drilling for discover of a sources for water supply of animal husbandry and agriculture. 40000 productive wells were drilled and constructed from 125 000 boreholes.

2.2) Exploration investigation for a groundwater sources for water supply of population and industrial centres and agriculture. More than 240-260 groundwater resources development deposits were prospected or explored.

2.3) Investigation for dewatering of mineral resources deposits, including in arid desert area: Copper deposit: Oyutolgoi, TsagaanSuvarga

Fluorite (CaF<sub>2</sub>) deposit: BorUndur, Urgun, Zuuntsagaan del, Hongor, Burjgar and others

Coal mining: Shiveevovoo, NariinSuhait, Tavantolgoi and others

2.4) Mineral water exploration: 5 hot and 6-7 cold mineral water deposits.

3. Main productive aquifers for urban centres:

- Inter-granular alluvial aquifers are used for centralized water supply: Ulaanbaatar, Darhan, Erdenet and other 11 aimagcentres,
- Inter-granular alluvial-proluvial aquifers, Permian, Devonian geological ages formation fissured aquifers are used for Ulaangom, Bulgan, Dalanzadgad,
- Neogene, Cretaceous inter-granular aquifers and other geological ages aquifers are used for BaruunUrt, Mandalgobi, Sainshand,
- Pre-Cambrian metamorphic gneiss and limestone-fissured aquifer are used for centralized water supply for Altay city.





### Keynote 3: Water supply management, challenges and priorities



#### Dr JANCHIVDORJ LUNTEN

Institute of Geography & Geoecology, MAS, Mongolia

Senior scientist, Head of Water Resources and its Utilization Department Institute of Geography & Geoecology, Mongolian Academy of Sciences, Dr Geographical Science.

Interest and Expertise: Global environmental problems, Water resources and their rational use, Water resources management in Arid area, Ecological study on the Watersheds, Agricultural Water supply

Dr Janchivdorj is Senior Scientist, Head of Water Resources and Utilization Department Institute of Geography & Geoecology, Mongolian Academy of Sciences. Chair holder UNESCO Chair program on Sustainable Ground water management in Mongolia.

He has PhD degree from the Mongolian National State University in geography. He is a certified consulting engineer on Hydraulics and certified project manager (PMP) from the respective national certifying organization (Mongolian agency of Construction development).

His duties include state of water ecosystem and rational use water resources study and environmental studies. His previous experience includes project management of various environmental projects throughout country including soil and water conservation and use and hydraulic constructions like irrigation systems and flood control constructions. Since its inception in 2008 he has developed with the Tsukuba University of Japan the UNESCO Chair program on Sustainable Ground water management in Mongolia. The goal of the UNESCO Chair program is to strengthen relationships and partner-nation capacity development for surface and ground water interaction in the water sources in Ulaanbaatar capital, Mongolia. This program, as part of the rational use drinking water and health security of water. He is also, the national project coordinator IAEA/TC and IAEA/RCA project on Determination of the fossil groundwater dynamics in selected depressions by using Isotope Techniques in Gobi Desert, Mongolia.

He authors of more than 200 scientific and popular work/projects. He has published 16 books and more than 110 articles in the field of Mongolian water management, environment protection water ecosystem and to combat desertification.



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## **Abstract**

### **Water Management in Mongolia: Problems and Challenges**

Mongolia is huge country and low population with a mix of nomadic and urban life. Accordingly, sustainable development of water management is a major challenge.

Mongolia has an extreme continental climate with marked differences in seasonal and diurnal temperatures and very scarce precipitation. Mean annual observed precipitation ranges from 38.4 mm to 389 mm. Depending on the geographic location land cover is frozen to a depth of approximately 3.5 m and rivers are frozen for up to 7 months of the year. Due to Mongolia's heavy reliance on ground water, the population must therefore rely predominantly on groundwater sources for household and drinking supplies, industrial/mining supplies and livestock watering. Mongolia isn't a rich country in terms of water resources. The potential water resources of the country are 36.4 km. About 70% of runoff flows out of the territory. 68 % of the territory of Mongolia located in the south dry steppe and Gobi Desert. Gobi area has been limited possibility implementation of world ecological concepts for use of groundwater resources in criteria annual groundwater recharge. There is a world concept for rational use of water. We found groundwater which has very low recharge in steppe Gobi region of Mongolia depending on the formation and dispersive feature of water resources and it is need to protect the groundwater resources and appropriate use of water resources. The result of survey shown that the groundwater age is 15000-35000 years old which was located in the bigger depression of South Gobi region: Mongolia have been used for mining industrial water supply. The recharge of groundwater is very low 1 mm a year and annual precipitation is 38.4-150mm in this region. In Gobi Desert areas ground water found to be high mineralized and salted due to natural factors. This causes essential problems for drinking water supply and its use often brings health problems for local people. According to latest statistical book of 2015, about 52.6 percent of Mongolian population is using poor quality water for drinking in the arid region of Mongolia. The government of Mongolia planned to improve the standard of drinking water quality in 117 Soum (administrative unit) centres, but has not implemented MDG on water supply issues. From these situations it can be concluded that, detailed Water Management and policy is needed to solve such problem.

According to studies, water consumption of population living Ger (National Dwelling for herders) districts of large cities, provincial centres, and nomadic herders is equal 8-10 litres per person per day, which is 4-5 times lower than the acceptable sanitary norms. However, water consumption in the Ulaanbaatar city exceeds the average of that in developed countries 220-260 litres per person average. The state's water policies are defined by the Constitution, Environment protection and Water law and by the policy document such as national water program /2010/ because we need for specific water supply management and related legal regulation. The law on Urban Water supply, sanitation and sewerage Use adopted in 2002 which was limited only to water supply for drinking water in urban centres. In the future we have to take into consideration the water supply in the rural areas, especially, to fulfil the water rights of herders. In water law, states that, water consumers have the rights to a supply of water that meets quality norms, a right wish is founded in the Constitution. Laws, rules and guidelines of water in Mongolia are having but implement is fully depending on poor water governance. Today there is no water resources management in Mongolia. Mongolian government doesn't pay any attention to water supply for all customers. Recently, Mongolians lost the traditional way of life to get place for living. The main criteria is conditioned by the place where water and grassland. That's why new approaches are needed for new management of water for half settled modern life.



## NOTE

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# NOTE

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Altai Mountains, Mongolia

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