GROUP STUDIES THE ECONOMICS OF WATER, AND IS WORRIED

Mongolia has two major water consumption areas – Ulaanbaatar and the southern Gobi region. The first has population pressure, while the second is where mining and economic activity will become more and more intense. The 2030 Water Resource Group recently conducted a hydro-economic survey of the two areas, and its reports on them contain water consumption growth forecasts, potential water resource availability, and such questions of supply and demand. B. Tugsbilegt talks to the Group's Mongolian Representative, Dr. D. Dorjsuren, on the study and the reports, Mongolia's water policy and legal environment, and other related issues.

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An important part of our report is the forecast of water usage growth, something never seriously attempted before on this scale. For this, we had to make a careful study of current demand and supply and the potential for their increase. We then sought to find out how to reduce the extent of the anticipated future growth of demand, and, correspondingly, how to increase water supply, the two together leading us to the most efficient solution to the whole problem. It is important to see things holistically and to study problems comprehensively, and from diverse angles such as the economy, investment, social benefits and environmental risks. At present, individual projects, in the Gobi or elsewhere, deal with their water issues in isolation, but we must have a broader approach that covers the entire region.

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So, to recap, on the one hand, we estimated the water demand and its growth and suggested ways in which it can be reduced, while on the other we identified the means to increase supply and make enough water available to meet the demand.

Miners now get all their water from underground sources. What alternatives are there?

At present, water for use in mines comes from:
- Underground sources close to the mine, lifted through wells;
- Subsoil reservoirs opened up during extraction work; and
- Recycled grey water from the nearby towns.

There can be another source. We can put surface water – that is, water from rivers -- into a reservoir and bring it into the Gobi through a pipeline. ▸

Total water demand in Nyalga Shivee Ovoo

Mn m³/year	Baseline	Low demand scenario		Medium demand scenario		High demand scenario	
Water Demand – Baseline	2015	2030	2040	2030	2040	2030	2040
Agriculture	2.94	3.96	4.83	4.21	5.34	4.49	5.91
Livestock	1.43	2.19	3.02	2.19	3.02	2.50	3.72
Domestic (Urban)	1.59	2.08	2.54	2.14	2.61	2.26	2.75
Domestic (Rural)	0.54	0.65	0.78	0.71	0.84	0.86	1.00
Industrial	1.72	1.75	1.78	1.78	1.88	1.92	2.46
Mining water demand	0.28	1.13	1.13	2.13	2.13	11.28	11.28
Sub-total Baseline	8.49	11.76	14.08	13.17	15.82	23.30	27.12
Water Demand - Projects							
Power Plants (Planned)		22.33	22.33	22.33	22.33	22.33	22.33
CTL & CTB (Planned)		19.34	19.34	19.34	19.34	19.34	19.34
Additional Mine water		1.83	1.83	1.83	1.83	1.83	1.83
Sub-total Planned Projects	-	43.50	43.50	43.50	43.50	43.50	43.50
Total Water Demand	**8.49**	**55.25**	**57.58**	**56.66**	**59.32**	**66.79**	**70.62**

Source: 2030 Water Resources Group

Total water demand in Tavan Tolgoi

Mn m³/year	Baseline	Low demand scenario		Medium demand scenario		High demand scenario	
Water Demand - Baseline	2015	2030	2040	2030	2040	2030	2040
Agriculture	0.01	0.01	0.02	0.01	0.02	0.01	0.02
Livestock	0.24	0.34	0.47	0.34	0.47	0.39	0.57
Domestic (Urban)	2.13	3.31	4.46	3.33	4.48	3.37	4.53
Domestic (Rural)	0.50	0.57	0.65	0.63	0.71	0.74	0.83
Industrial	0.25	0.38	0.53	0.63	1.17	1.25	3.65
Mining water demand	0.34	1.12	1.12	6.15	6.15	12.71	12.71
Sub-total Baseline	3.66	6.87	8.38	10.46	12.38	17.43	21.28
Water Demand - Projects							
Power Plants (Planned)		-	-	1.20	1.20	1.20	1.20
Coal wash (Planned)		-	-	2.27	2.27	4.54	4.54
Power Plants (Existing)	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Coal wash (Existing)	0.76	0.76	0.76	1.51	1.51	2.27	2.27
Additional Mine water		-	-	1.17	1.17	1.88	1.88
Sub-total Planned Projects	0.89	0.89	0.89	6.28	6.28	10.03	10.03
Total Water Demand	**4.55**	**7.76**	**9.27**	**16.75**	**18.66**	**27.46**	**31.31**

Source: 2030 Water Resources Group

We studied each of these in terms of efficiency, economic and social costs, and environmental-friendliness. So we now have an idea of what the best way is to meet the water demand in the southern Gobi. The study was conducted by people from Pricewaterhouse Coopers UK's Indian and Mongolian branches who held meetings with all related parties and sources and verified available data. Thus, we have gotten to know the situation on the ground and the real data.

How do you think mines in the Gobi region can reduce their water demand?

Part of the Choir Basin, the coal basin in Shivee-Ovoo is somewhat special in that it has relatively abundant water resources. We feel that until 2030, the current practice of using underground water and recycling subsoil water in the mine is sufficient to meet demand in the area. Even if a large power plant comes online there, the surface water should be enough for its needs. Water from the Kherlen and its basin and flood water can be collected in the dam and transferred to user facilities.

The Tavan Tolgoi area is different. Here it is imperative to come up with technology that drastically minimizes water consumption. Dry processing of coal will be very important. In this area, coal mines do not have very much water under them and there is almost no opportunity to recycle this kind of water. The few water sources in the areas surrounding the mines are small, and there is little chance that fresh underground water resources will be found. Smart solutions like what Energy Resources has adopted should be more widely practiced. In addition rainwater should be collected and there should be strictly no use of underground water beyond prescribed limits, defined according to environmental guidelines.

I believe your report states that in the capital city, demand will outstrip water supply as early as 2021.

We have not been so specific, but have said that if nothing is done current water resources, supply capacity and distribution methods will be unable to meet Ulaanbaatar's water demands in the next decade, or some time before 2030. Several apartment districts and big users, including industrial and commercial ones, could go dry.

Water demand estimates 2010-2030 for low, medium and high water demand scenarios

	Low			Mid			High		
mn m^3/yr	2010	2021	2030	2010	2021	2030	2010	2021	2030
Domestie demand	38.40	47.04	62.90	38.40	51.08	68.97	38.40	57.40	78.37
Utility services	6.83	9.33	12.37	6.83	11.81	15.85	6.83	20.91	28.30
Industry	3.68	4.95	5.34	3.68	7.09	7.72	3.68	11.08	12.07
Energy	22.50	30.25	37.98	22.50	43.31	54.40	22.50	67.68	84.49
Agriculture	2.32	3.95	2.99	2.32	5.72	4.71	2.32	7.56	6.50
Other	2.20	2.25	2.25	2.20	2.25	2.25	2.20	2.25	2.25
Total	75.93	97.77	123.84	75.93	121.27	153.90	75.93	166.90	211.99

Note: Utility services include: hospital, school, office and public services.

Source: 2030 Water Resources Group

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Photo by Kh.Gambaatar

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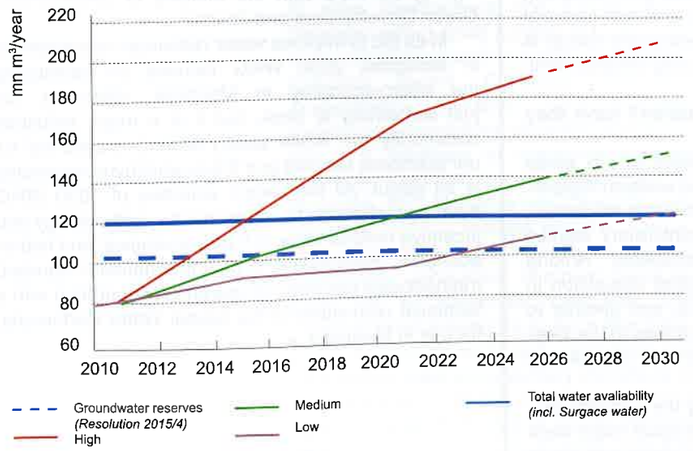
Source: 2030 Water Resources Group

Water supply demand gap across three water demand scenarios (2010-2030)



Source: 2030 Water Resources Group

We have suggested some steps to mitigate this outcome. The 160,000 cubic meters of water distributed every day from the central water treatment facility can be recycled for suitable use, including in power plants and in the leather industry.

How effective are our present water resource management laws?

The overall legal environment is well structured, I would say. A 10-year Water program was taken up in 1997 and towards its end I was Secretary of the National Water Committee. The Government, particularly the Ministry of Environment and Tourism, then approved several water-related projects. I can think of Water Renewal-21, for example, for improving water supply and sanitation facilities, another for improving urban water supply arrangements, another for supplying better drinking water nationwide, in both urban and rural centers, etc. ▸

Some of them were not so successful, and in 2008 and 2010, two presentations were made on their implementation to the National Security Council. I remember that L. Gansukh, the then-Environment Minister, called his 2008 presentation, "The state of Mongolian water resources, the status of implementation of water programs, and further measures to be taken", and the 2010 one "Mongolia's water pollution, monitoring and further measures". The NSC decided to prepare a comprehensive state policy document on all water-related issues. The national Water program was modified, and it was decided that a medium-term program should be implemented from 2010-2021.

The program incorporated important principles, such as protecting areas contributing to the formation and presence of major water resources, the state taking over full control of such resources nationwide, regular monitoring to prevent water pollution and water scarcity, building reservoirs and other such facilities to prevent water shortages due to climate change, disseminating information on the efficient use of water and related technology, etc.

All this required a new legal framework. The Water Law from 2004 was amended in 2012, to give it more teeth; expanded to encompass more things under the law, such as protection of water sources, fines for polluters, incentives for those who used water efficiently and recycled it; and coordinated the water governance activities of different state organizations.

Another important law to be passed dealt with water pollution. Mongolia has been badly affected by climate change, with extensive loss of water resources. It is imperative to protect those that remain, and offenders must be penalized. This was the principle behind the law which ensured that the people are the real owners of the nation's water, the state would be responsible for water supply, and all water resources in Mongolia are protected and water must be used efficiently. The intentions were good, but implementation has been lax, some would say totally ineffective, despite some good steps being taken, such as setting up river basin authorities.

What will 2030 Water Resources Group do now?

As part of our work for the proper development of the hydro-economy, we are now giving technical support to the Ministry of Environment and Tourism for preparing a new methodology for implementation of the water pollution law in order that more water is saved and recycled. We are studying best practices around the world and how to replicate them here. Apart from the two reports we have prepared and talked about, we are working on designing a water evaluation methodology and financial and non-financial incentives. I feel the work of 2030 Water Resources Group is contributing much to the Mongolian water economy development.

How do you rate our country's water studies? Have they been comprehensive or deep enough?

Some good studies were made in the 1960s of the whole territory, especially of the southern Gobi and the western regions. These led to the identification of underground water resources, the start of hydrogeological mapping, and exploratory studies of fresh underground water resources prospects. Among specific projects I can mention a hydrogeological expedition in Bayankhongor province to study the Gobi area, and another to Choir to study water prospects for mining operations in the Gobi area. Another expedition conducted studies in the central and other regions.

With support from the Soviet Union during the socialist era, nationwide small- and medium-scale hydrogeological maps were prepared and detailed exploration was done in areas with water resources.

At present, we feel that before mining starts anywhere, the issue of where the water will come from should be made clear. Even if an area seems to have enough water at the moment, additional studies are required for the mine's lifetime. The Gobi is very vast, and we must make detailed studies of the areas where factories, mines and townships will be developed.

At present, industries are using underground water. There was great optimism about projects such as the use of water from the Kherlen and the Orkhon rivers, but now it seems even these would not be able to meet the Gobi region's needs. Are more surface water projects being considered?

Climate change has affected both how and how much it rains. We no longer have light but continuous rain for days at a stretch. Instead, there is heavy rain for briefer periods and floods follow. We can collect and store the flood water from these two rivers, but much bigger facilities will be required to do this. Also, rivers are carrying less water. So before we take up a surface water project, we have to make a thorough and detailed feasibility study. Surface water will become more important in the 2040s. Bringing technologies to all dry regions to minimize water consumption could be our best contribution to sustainable water resources management.

Finally, tell us more about your organization.

The World Economic Forum has a Water Resource Group. Water has been one of the five major issues discussed at the Forum's meetings since 2010. One of the chief impacts of climate change has been on fresh water resources, which are rapidly decreasing. Only 3 percent of the world's water is fresh water, and just 0.3 percent of that can be used by humans. Today 1.3 billion people do not have easy access to enough fresh water. Thus, water is a natural priority for our survival.

In 2010, the then-President, Ts. Elbegdorj, sought help from the WEF's water resources group for better water resources management in Mongolia. It took some time to make the arrangements, but finally in 2013 the group started its operations here after signing an MoU with the Ministry of Environment, Green Development and Tourism.

In its bid to improve water resources management in Mongolia, 2030 WRG focuses on developing the hydro-economy in Mongolia. Water is not just something to drink, but it is a major industrial commodity, too. Water supply security is essential for our economic survival and this is what hydro-economy is all about. All the recent activities of 2030 WRG have paid attention to improving the methodology and incentive mechanisms of hydro-ecological and hydro-economic assessment. A new international standard methodology has been prepared in cooperation with a technical committee of the Global Water Partnership for use in Mongolia. ■