

# ORSAM

# ORSAM WATER BULLETIN

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Issue 122

#### **ORSAM WATER BULLETIN**

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#### \* Turks have high profile in global water institutions

As is well known, both the quality and the quantity of water resources are adversely affected by the fast-growing population of the world, climate change, increasing urbanization and the development of agriculture and industry.

There is a total of 1.4 billion cubed kilometers of water in the world and 97.4 percent of this amount is salt water while only 2.6 percent is fresh water. The majority of the fresh water is located in the polar regions.

Water availability becomes more and more important every single day, and especially so in arid regions. The establishment of institutes and organizations focusing on water studies started in the 1970s in conjunction with a general emphasis on environmental policies to preserve water resources and ensure their efficient use. The earliest were large international organizations such as the United Nations Economic Commission for Europe, the World Bank and the United Nations Environment Programme. Some of the other principal international organizations that specialize in this area are the International Water Resources Association (IWRA), established in 1971; the International Water Management Institute (IWMI) and the Stockholm International Water Institute (SIWI). The IWRA is a leading, reliable, education and development-oriented, international non-profit, non-political and nongovernmental organization well known for improving understanding on water issues and as a defender of the management of the world's water resources as well as building and enhancing related partnerships and mechanisms.

In addition, the World Water Council was established in 1996 -- four years after the 1992 Rio Earth Summit -- along with the Global Water Partnership (GWP), which was established in the same year jointly by the World Bank, the United Nations Development Programme (UNDP) and the Swedish International Development Cooperation Agency (SIDA). The mission of the World Water Council, which is known as an international policy think tank, is to ensure global sustainability of critical life resources and the protection, development, planning, management and use of water in all its dimensions with the aim of promoting awareness of the fair use of water at the highest decisionmaking level. Moreover, the World Water Council organizes the World Water Forum every three years. Turkey hosted the World Water Forum successfully in 2009 in İstanbul and this achievement



was followed by the creation of the İstanbul International Water Forum, held every two years. The first of these was organized in 2009 and the second in 2011. The aim of the İstanbul International Water Forum is to provide a platform for more cooperation and coordination among international and local water stakeholders in Turkey and around Turkey in order to address regional water issues more deeply and come up with joint solutions.

Due to its geography and water resources, Turkey is one of the countries at the forefront when it comes to water studies and trans-boundary water resources in particular. A regional development project, the Southeastern Anatolia Project (GAP), realized by Turkey in the Euphrates and Tigris basin, known in history as Upper Mesopotamia, is one of the main issues on the agenda within the scope of water studies.

Engineers, specialists, officials and other professionals from Turkey have begun to take on important roles at these institutions that shape the world's water agenda and policies. Dr. Olcay Ünver, GAP Regional Development Agency director from 1991 to 2003, has been working as UN World Water Assessment Programme coordinator since May 22, 2007. The World Water Assessment Programme was established in order to ensure coordination among institutions within and outside the UN on the management of world water resources. In addition, this organization prepares the World Water Development reports as well.

#### Turkey more active in world's water agenda, policies

Professor Doğan Altınbilek became the president of the executive board of the International Water Resources Association as of Jan. 1, 2013, for the 2013-2015 term. Professor Altınbilek, who also served as president of the International Hydropower Association (IHA) from 2004 to 2008, was also a member of the executive board of IHA from 2002 until Feb. 15, 2013, and he is still an honorary member. Professor Altınbilek organized the International Hydropower Association World Congress in 2007 in Antalya, in which former President and Prime Minister Süleyman Demirel also participated. In addition, Professor Altınbilek was elected vice president of the bureau of the board of governors of the World Water Council (WWC) for a two-year term beginning in 2013. In the same elections, Dr. Akif Özkaldı, general director of the State Waterworks Authority (DSİ), and İrfan Aker from Dolsar Engineering were elected to serve as governors on the board, and Haluk Büyükbaş,



secretary-general of the Turkish Contractors Association, was elected to be an alternate governor, to name just a few of those representing Turkey in this international assembly. The WWC is the agency that organized the 5th World Water Forum in İstanbul. The Turkish Water Institute, which took part in organizing the forum as well, serves as an observer on the board of governors of the WWC for three years until 2018. In light of this information, one can easily say that Turkey has a strong level of representation on the WWC.

On Nov. 2, 2011, the Turkish Water Institute (SUEN) was established. The priority of SUEN, the most recent actor in Turkish water management policy, is to guide and monitor water studies for the future; to develop the short-term and long-term water management strategy of our country and to ensure coordination among institutions and organizations working for water management. In addition, as one of the organizers of the 5th World Water Forum, SUEN represents our country at international water events. The president of SUEN, Professor Ahmet Mete Saatçi, is the term president of the International Network of Basin Organizations (INBO)-Europe and SUEN serves as the secretariat for the European INBO conference, as well.

In 2012, Dr. Hüseyin Gündoğdu was elected vice president of the International Commission on Irrigation and Drainage (ICID), a nongovernmental organization established in 1950. ICID is a scientific and technical organization working on the issues of irrigation and drainage, techniques for efficient and productive irrigation, improving water and increasing the efficiency of water use as well as disseminating these developments throughout the world. ICID cooperates with water-related institutions in cooperating countries, which in Turkey is the DSİ.

There are experts from our country participating in the work of these institutions which play an important role in the protection and efficient use of water resources as well as shaping global environmental policies. This has eliminated the shortcoming of not having experts in the management of these institutions from our country, which is significant because trans-boundary water resources are a critical element of foreign policy. This shortcoming previously meant that Turkey could not take part as a decision-maker in drafting legal texts on water and that Turkey had difficulties explaining its case on water to the world. Now, taking part in the work of these institutions will provide the opportunity for Turkey to promote its experience and its knowledge of water policies widely and in a more efficient manner so that they can be used extensively. Turkish



experts' experience and participation in international organizations devoted to water issues will be key to establishing new water policies.

"Turks have high profile in global water institutions", 07/04/2013, Tuğba Evrim Maden, online at: <u>http://www.todayszaman.com/news-311878-turks-have-high-profile-in-global-water-institutions.html</u>

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## \* Longest Water Pipeline Being Built in Turkey, Zaman Says

<u>Turkey</u> is working to finish a 9,300- kilometer (5,800-mile) water pipeline in the Harran Plain that when done later this year will be the world's longest, the Today's Zaman newspaper reported. The pipeline in southeastern Turkey, most of it installed 1.6 meters (5.2 feet) underground, is part of the 200 million- lira (\$111 million) Harran Plain Closed Drainage Project, the paper said, citing Gursel Kusek, an official from the Ministry of Food, Agriculture and Animal Husbandry. Kusek told the paper that the project is taking place to help address high levels of total dissolved

Kusek told the paper that the project is taking place to help address high levels of total dissolved solids in the shallow groundwater due to logging, irrigation, rising water tables and drainage problems.

"Longest Water Pipeline Being Built in Turkey, Zaman Says", 04/04/2013, online at: http://www.bloomberg.com/news/2013-04-04/longest-water-pipeline-being-built-in-turkey-zaman-says.html

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## \* Northern Cyprus Sees Hope in Water Pipeline

ISTANBUL — Even as the Cypriot government struggles to ward off financial disaster, the authorities in the northern part of the divided island are quietly pushing ahead with a project to link their territory, physically and economically, more closely with <u>Turkey</u>, their powerful neighbor and protector.

Under the ambitious project, expected to cost at least 1 billion Turkish lire, or \$550 million, Turkey would sell water to the northern sector, which it calls the Turkish Republic of Northern Cyprus, using an experimental technology: a pipeline in the Mediterranean Sea.

The pipeline is under construction, scheduled to start delivering Anamur River water from Turkey's southern province of Mersin next March. But environmental experts question the sustainability of transferring water out of its natural basin, and outside engineers are watching to see how the government project works out in practice.

The project calls for Turkey to transfer 75 million cubic meters, or 19.8 billion gallons, of water a year to Northern Cyprus.

The transfer agreement between Turkey and Northern Cyprus "is valid for 30 years and can be renewed for an additional 5 years," said Ayhan Taskin, director of water supply at the Turkish State Hydraulic Works. The water will be collected at the new Alakopru Dam, transferred via the undersea pipeline, then deposited into a reservoir behind the Gecitkoy Dam, also new, near the coastal city of Girne.

Transfers of water from one basin to another and other engineering projects are favored by some governments as a quick-fix solution to meet growing demand in drier regions. Proposals for such projects are on the rise, but environmentalists say there are alternatives, including the ability to increase conservation and recycling before turning to these long-distance transfers. Water use worldwide in the 20th century grew at more than twice the rate of the global population, according to a U.N. report in 2011.



Denis Landenbergue, freshwater program manager for World Wildlife Fund International in Gland, Switzerland, said by telephone last month that the group applied a "precautionary approach to these kinds of projects."

Such projects have actually been shown to increase demand for water rather than satiate it. Consider the Tagus-Segura pipeline, running 286 kilometers, or 178 miles, that opened in Spain in 1978.

The water it delivered to the Segura region led to an expansion of irrigated land and urban development on the coast, according to a WWF report on water transfers. The pipeline "multiplied the initial 'water deficit' that it was supposed to solve," the report asserted.

On both sides of Cyprus, climate change and population growth are increasing demand. Precipitation decreased by more than a quarter over the past 96 years, said Huseyin Gokcekus, vice rector at Near East University in the Turkish sector of Nicosia, and general coordinator for water in Northern Cyprus's Ministry of Agriculture and Natural Resources. Water mismanagement further exacerbates the problem, he said. For decades, residents have pumped out more groundwater than nature could replace. That has allowed saltwater to enter aquifers along the island's coast.

"Ninety-two percent of the country's water is obtained from groundwater," he said, adding that Northern Cyprus lacks both public education on conservation and infrastructure for water recycling.

On the southern side of the island, the Republic of Cyprus will receive no water from this project. It is turning instead to recycling and <u>desalination</u>.

"We're determined to use desalination and recycled water to augment our supply of water," Kyriacos Kyrou, water director for the republic's Water Development Department, said by telephone.

The country has five desalination plants that together can process 250,000 cubic meters of water a day, he said. Still, the country aims to reduce dependency upon fossil fuel-intensive desalination by ramping up water recycling, he said.

In Northern Cyprus, the fresh water bounty from the new pipeline could create a perverse incentive to increase farming, as occurred in Spain.



Half of the water transferred from Turkey "will be used in agriculture," Mr. Gokcekus said. But farmable acreage will not be expanded in the first phase of the project, he said. Instead, the transferred water will replace the salty groundwater now used by farmers for irrigation.

To help ensure the best use of the new water supply, Mr. Gokcekus is working with the territory's Parliament on a law to address water-wise crop choices, irrigation systems that conserve water, public education, rainwater harvesting and infrastructure to recycle domestic water.

Mr. Landenbergue of the WWF said, however, that such measures should be completed before moving forward with a water transfer project. He said he could not speak specifically about the Northern Cyprus pipeline because he had not studied it.

But even if Northern Cyprus can avoid the classic pitfalls of water transfer projects, Mersin Province in Turkey could fall prey to donor-basin problems. Reduced water flows have environmental, social and economic impacts, according to the WWF. Altering natural flow systems can lower water tables, increase saltwater intrusion to coastal areas, and harm fish migration and spawning, it said. But Mr. Taskin of Turkey's water agency said by e-mail that his country would be transferring just one-tenth of the annual flow capacity of the river. "Turkey will not encounter any water shortage due to this project," he said.

The few hundred people who have been displaced by the Alakopru Dam in Turkey have been resettled, Mr. Gokcekus said. They will also benefit from the chance to farm some of the 4,000 hectares, or 9,880 acres, of new irrigated area in Mersin Province and to use some of the estimated 26 megawatts of electricity generated annually by the dam, he said.

Water transfers also risk conveying invasive species from the donor basin to the destination. "It's often underestimated, and there are lots of cases where invasive species are causing huge trouble for the ecosystem, biodiversity and the economy," Mr. Landenbergue said.

Still, the environmental concerns could end up being moot. The pipeline, promoted as the first of its kind in the world, is experimental. Some observers wonder what kind of difficulties its builders will encounter, or if it will even be built.



The underwater section of the pipeline will be approximately 80 kilometers long, Mr. Taskin said. It will be made of high-density polyethylene, a material commonly used to transport water. It will cross a channel as deep as 1,430 meters, or 4,700 feet, but the pipeline will be suspended 250 meters below the surface, according to the Turkish State Hydraulic Works.

Each 500-meter section of pipe will be tethered to the sea floor far below. Planning engineers also considered potential hazards like earthquakes and the high level of submarine traffic in the area.

The unconventional design was created by the Turkish firm Alsim Alarko, based in Gebze, with engineering support from other Turkish and foreign companies. Turkey's water department has awarded the construction contract to a joint venture of Malaysian and Turkish companies. Executives from the joint venture declined to speak about the project.

Engineers outside the project are intrigued by it. H.P. van Rossen, manager of installation analysis at Saipem France, a construction firm that works in subsea <u>oil</u> and gas but is not involved in the water project, said the pipeline was "a novel concept."

"This project has little in common with the undersea pipelines used to transmit oil and gas," he said, in that most conventional offshore pipelines are made of steel and can be placed at depths up to 3,000 meters. They usually rest on the sea floor, thanks to water pressure, the weight of the pipe and the density of the contents.

Mr. van Rossen said the fluid dynamics of the water pipeline would be different. Because seawater is denser than fresh water, the fresh water effectively floats in the salt. Also, the pipeline material "has a density close to the water, so the line will be quite neutrally buoyant," he said.

But the long tethers required for the project could be problematic, he said. Earthquakes could destroy anchoring points, or a tsunami could break the floating line. Nevertheless, if the pipeline broke, it would not create the same ecological damage as, say, an <u>oil spill</u>, he added.

Contractors began building the Alakopru dam in Turkey in 2011 and the Cyprus dam in March of last year. "Construction work on both dams is continuing," Mr. Taskin said. Alakopru was 75 percent complete in late March, and Gecitkoy was 40 percent complete, said Mr. Gokcekus, who has visited



the work sites and attended meetings with the construction firm. With work under way on each end of the line, the construction team planned to lay the pipes for the sea crossing later this year, he said.

Both the Turkish State Hydraulic Works representative and Northern Cyprus water coordinator say the project is on schedule to be completed by March 2014.

Emphasizing caution, the WWF report said a project like this "usually reflects ignorance of the social and environmental costs and a failure to adequately consider better, local alternatives, such as improved management of local demand."

But Mr. Gokcekus disagreed, citing climate change and population growth as inexorable strains on water supplies. "Water transfers between countries have become inevitable," he said.

Otherwise, he cautioned, territorial disputes over water could surpass current disagreements over rights to deposits of oil and natural gas.

"Northern Cyprus Sees Hope in Water Pipeline", 03/04/2013, online at: <u>http://www.nytimes.com/2013/04/04/world/europe/northern-cyprus-sees-hope-in-water-pipeline.html?pagewanted=all&\_r=0</u>

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## Mideast Region Must Address Water Concerns

Turkey is now in the midst of an <u>unprecedented peace process</u>. The decisiveness shown by the parties is promising, but the road is long. The process is complicated and requires maximum sensitivity and care. A climate of peace is important not only for Turkey but for the region as well. There will definitely be changes in the economic and social structures of the region.

I want to look at this new era from an old viewpoint, namely that of water balances in the region. Recently, <u>research released by NASA</u> drew attention to new possible dangers in the region because of problems arising from misuse of the region's water resources. This research seems to agree with expert commentary that from now on wars in the Middle East will be about water instead of oil. NASA's research revealed that the loss of fresh water in the region has reached dangerous levels. One of the most important findings was the loss of 144 cubic kilometers of fresh water reserves in the Tigris and Euphrates basins of Turkey, Syria and Iran.

The NASA research, which goes back to 2003, determined that fresh water reserves approximately the size of the Dead Sea have been lost because of bad management, increasing demand for underground water and the 2007 drought. The research found that 60% of this loss is caused by pumping water out of underground reserves. While regional demand is growing fast, countries of the region are unable to coordinate water management because of their conflicts.

The NASA research is once again pointing to an important reality: drinking water in the Middle East is rapidly becoming scarce and some countries are likely to have water problems. During the UN Climate Conference in Doha last year, the World Bank issued serious warnings that reduced water resources could become a serious problem in the Middle East and North Africa.

According to the predictions of several organizations, <u>water conflicts</u> will be a major issue in the coming years and will emerge as the primary cause of wars in the region. One prediction that requires careful attention is that after 2022, access to water resources in the Middle East, Asia and North Africa might be used as an instrument of war.

Data obtained by the NASA research therefore concluded that one-fifth of lost water is because of the soil drying out and a snowfall reduction. Evaporation of lakes and water reserves results in the loss of another fifth. The rest of the loss is because of a 90 cubic kilometer reduction in underground water reserves. Such a loss used to meet the needs of nearly 100 million people.



While the Middle East is undergoing this rapid water loss due to misuse and climate change, what is Turkey doing? It continues with controversial policies that disrupt ecosystem balances and disrespect nature. While hydroelectric dams and reservoirs are being built carelessly, rivers and streams are drying up and the death warrant of underground water reserves is signed with every wrong drilling. Another misguided policy is to encourage farmers to resort to irrigated agriculture, even in areas where dry agriculture is possible.

In light of the latest NASA data, Turkey and regional countries have to develop and apply an emergency plan of action for the correct use of water resources. Policies are not always decided by parties sitting around a table. If we do not pay attention to phenomena such as climate change, drought and misuse of natural resources today, one day these issues will reach desperate levels if necessary measures are not put in place.

"Mideast Region Must Address Water Concerns", 01/04/2013, online at: <u>http://www.al-monitor.com/pulse/security/2013/04/middle-east-water-issues.html</u>

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#### \* Iraq's historic Lake Sawa suffers from neglect

One of the most well-known lakes in Iraq, Lake Sawa, is a large closed body of salt water situated in the desert between Baghdad and Basra.

The lake is dubbed by some as "the Pearl of the South" for its beauty and unique composition. It is surrounded by a cliff of piled sand dunes, providing a natural levee that keeps the water above ground level. And as the lake has no proven link to either river or sea, the source of its water has been a mystery to researchers for centuries.

"There are those who believe that the lake is linked to the red sea or to other remote lakes, while some people believe that the water of the lake come from rains of al-Dammam basin or from the west desert. There are different opinions, but the most likely is that the water of the lake comes from groundwater in this location," says Dr. Ali Hussein, head of the Research and Studies Centre in Samawah University.

Four species of small fish and other aquatic organisms have been found in Lake Sawa, which stretches about four kilometers long and one kilometer wide, says Hussein.

"The studies proved that there are four species of small fish that grow to a certain size of 15 cm or 20 cm. The purpose of the fish and aquatic organisms in the lake is to feed migratory birds, but the fish themselves are not fit for human consumption [due to high fat content]," explains Hussein.

Sodium, potassium, calcium, magnesium, sulphur, chlorine and carbonates are the essential elements that make up Lake Sawa's water and, with further studies, could prove useful in treating skin conditions, says Hussein.

"There are many people who suffer from skin diseases in this area and in the surrounding areas. They come and swim in the lake for it [their condition] to improve, diseases, skin diseases. Yes, part of the answer is that yes it can be used as a natural cure for skin diseases. But this needs more research and studies to reach certain facts for it to be offered as a place that can treat certain types of skin diseases," he says.

Lake Sawa was once a popular tourist destination attracting visitors from the nearby city of Samawah and all over the country. But years of neglect has turned the resort into a dilapidated ghost town, just like many other touristic and historic destinations in Iraq.



"There was a resort and it was teeming with tourists. There were also installations as you see. But it had been stolen and vandalized after the first Gulf War in 1990. The same thing happened in 2003," laments geomorphologist Sa'ed Jassim.

The Iraqi Ministry of Tourism and Antiquities is currently seeking investors to help with tourism projects in al-Diwaniyah province, according to local media, in an attempt to revive tourism in local landmarks including Lake Sawa.

"Iraq's historic Lake Sawa suffers from neglect", 01/04/2013, online at: http://english.alarabiya.net/en/perspective/features/2013/04/01/Iraq-s-historic-Lake-Sawa-suffers-from-neglect.html

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#### \* Fifteen new dams to come on stream in Iran

Fifteen new dams will be inaugurated across Iran by the end of the current Iranian calendar year, which began on March 21, IRNA News Agency quoted Managing Director of Iran Water Resources Management Company Mohammad Haj-Rasouliha as saying.

The dams will have a total water storage capacity of 6 billion cubic meters, he added. The existing dams gave a total storage capacity of 52 billion cubic meters, he noted.

In August 2012, Haj-Rasouliha said that according to the fifth five-year development plan, which started in March 2011, one dam should be built each month.

Some 36 billion rials (around \$3 billion) has been allocated for dam building, he noted.

Some 3 billion cubic meters of surface waters in Iran are being reserved behind dams, Energy Minister Majid Namjou said in June 2012.

He told the IRNA News Agency that 75-80 percent of surface waters are poured into the dams.

Iran ranks first in the region and third in world in terms of dam construction industry, First Vice President Mohammad Reza Rahimi announced last year.

He added that currently contractors are building 135 new dams across the country and also doing several projects in other countries.

In July 2011, Iran celebrated self-sufficiency in dam construction by inaugurating the Karun-4 dam, the largest concrete dam in Iran, which has been completely designed and constructed by domestic engineers.

"Fifteen new dams to come on stream in Iran", 06/04/2013, online at: http://www.payvand.com/news/13/apr/1036.html

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#### \* Ahmadinejad Inaugurates Large Dam in Northeastern Iran

TEHRAN (FNA)- A large reservior dam, constructed by Iranian experts, was inaugurated in the Northeastern Khorassan Razavi province in a ceremony attended by President Mahmoud Ahmadinejad.

The Aradak reservoir dam is located about 70 km to the Northwest of Mashhad. The 410-meter-long dam is constructed on Aradak River.

In July 2012, Iran inaugurated its highest roller-compact concrete (RCC) dam in the Southwestern province of Khuzestan in a ceremony attended by President Mahmoud Ahmadinejad.

President Ahmadinejad inaugurated the Upper Gatvand Dam, which is located five kilometers from the city of Gatvand and has the country's second largest reservoir after the Karkheh Dam.

Iran is a leading country in dam construction and many countries, including Sri Lanka, Syria, and Tajikistan as well as several African states, have entered either dam construction or consultation projects with Tehran.

Earlier this year, Managing-Director of Iran's Water Management Company Mohammad Haj-Rasouli praised Iran's eye-catching progress in area of dam construction in recent decades, saying Iran is now among the world's top dam-builders and enjoys the most advanced technology in the field.

Iran is among five major dam-constructor countries in the world, Haj-Rasouli said in Southern city of Bandar Abbas in February, and added that the country has currently 145 operational dams with the total capacity of 50 billion cubic meters.

Referring to the fact that dry and semi-dry climate has dominated some 75 percent of Iran's soil, he said that during the past decade, the country has faced severe climate situation and lack of rainfalls.

However, he added that the crisis was successfully overcome to some extent through appropriate management and planning.

Iran is now viewed as a leading country in dam building. Iranian specialists now provide consultation services for the design and construction of various dams in different sizes.

"Ahmadinejad Inaugurates Large Dam in Northeastern Iran", 04/04/2013, online at: <u>http://english.farsnews.com/newstext.php?nn=9107157410</u>

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#### Iran: More farmers' protests over water shortages

NCRI - Furious farmers angry at water shortages have this week staged more demonstrations near the city of Isfahan.

The latest protests come after the regime brutally crushed gatherings of farmers in February this year.

Violent scenes erupted two months ago in the city of Varzaneh when protesters set fire to three buses carrying state security forces.

Several farmers were killed and injured, and at least 160 arrested, by the state's SSF anti-riot squad troops at the time.

They had accused the regime of turning the Zayandehrood River into a parched valley.

The Zayanderood begins on the central plateau of Iran and supplies water to people in the central Iranian provinces of Isfahan and Yazd - but it has dried up over the past four summers.

"Iran: More farmers' protests over water shortages", 05/04/2013, online at: <u>http://www.ncr-iran.org/en/news/iran-protests/13281-iran-more-farmers-protests-over-water-shortages.html</u>

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## ✤ 25% Rise in Water Reserves of Dams

Water reserves in dams stand at 25 billion cubic meters, which has grown by 25 percent, said the head of Water Resources Management Company.

Mohammad Haj-Rasouliha put the average precipitation rate at 178 millimeters, Fars News Agency reported.

He said 15 dams will be made operational across the provinces of Khorasan Razavi, North Khorasan, South Khorasan, Fars, Isfahan, Sistan-Baluchestan, Zanjan and Khuzestan by the end of the current Iranian year (March 2014).

Close to 124,000 hectares of irrigation and drainage networks have been established under the Mehre Mandegar Project (which plans to complete semi-finished projects) since last year.

Haj-Rasouliha expressed hope that 52,000 hectares would be added to the network in the first six months of the current Iranian year.

A large reservoir dam, constructed by Iranian experts, was inaugurated on Wednesday in the northeastern Khorasan Razavi province in a ceremony attended by President Mahmoud Ahmadinejad.

The Aradak Reservoir Dam is located 70 km to the northwest of Mashhad. The 410-meter-long dam is constructed on Aradak River.

Iran is a leading country in dam construction and many countries, including Sri Lanka, Syria, and Tajikistan as well as several African states, have undertaken joint dam construction or consultation projects with Tehran.

"Iran is among five major dam builders in the world," he said in the southern city of Bandar Abbas in February, adding that the country currently has 145 dams with a total capacity of 50 billion cubic meters.

"25% Rise in Water Reserves of Dams", 06/04/2013, online at: http://www.zawya.com/story/25 rise in water reserves of dams-ZAWYA20130406055249/

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WWW.ORSAM.ORG.TR

Mithat Paşa Caddesi 46/4 Kızılay-Ankara TURKEY Tel: +90(312)4302609 Fax: +90(312)4303948 orsam@orsam.org.tr



#### Syria refugees draining water resources in Jordan: Aid group

AMMAN Hundreds of thousands of Syrian refugees in Jordan are stretching the kingdom's meagre water resources "to the limit," two British aid agencies warned on Friday, calling for international help.

"The Syrian refugee emergency is highlighting one of Jordan's most pressing problems - water," said Christian Snoad of Oxfam, in a joint statement with the British Red Cross.

"Solutions need to be found to deal with Jordan's water scarcity and this will need to be done as a matter of urgency.

"The Jordanian government will need... large-scale help from governments around the world to address this critical issue," said Snoad.

Jordan has taken in waves of Palestinian and Iraqis refugees who fled conflicts over the past few decades, and now hosts more than 450,000 Syrians, including 120,000 in the sprawling northern border camp of Zaatari alone.

The kingdom's "water supply system, already under severe strain, is being stretched to the limit by the large influx of refugees fleeing conflict in Syria," the statement said.

Faced with chronic water shortages, Jordan, whose own population has been growing at an annual rate of 3.5 per cent, has been forced to extract more water from the ground since the mid-1980s. More than 3,500 cubic metres of water are delivered each day into Zaatari, providing refugees with clean water for drinking, cooking and cleaning, said the statement.

"It's just a matter of time before the main sources run out. In some areas, groundwater extraction is nearly three times the recharge rate," it added.



Syrian refugees could afford to buy filtered water in Jordan, one of the world's 10 driest countries, where desert covers 92 per cent of its territory.

"Syria refugees draining water resources in Jordan: Aid group", 07/04/2013, online at: http://www.omantribune.com/index.php?page=news&id=140544&heading=Middle%20East

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WWW.ORSAM.ORG.TR

Mithat Paşa Caddesi 46/4 Kızılay-Ankara TURKEY Tel: +90(312)4302609 Fax: +90(312)4303948 orsam@orsam.org.tr



## Will Syria's Refugee Crisis Drain Jordan of Its Water?

Now that spring has arrived in the <u>Middle East</u>, Syria's estimated 1.2 million refugees in Turkey, Lebanon and Jordan can hope for relief from the snow, the rain and the bitterly cold nights of winter. But that relief will be as short-lived as the region's balmy weather. Summer is fast on its way, and in Jordan in particular, life for Syrian refugees, and the border communities that support them, is about to get a lot worse.

Jordan is one of the most water-stressed countries in the world, subject to an ongoing <u>drought</u> that has devastated agricultural prospects in the country's northern areas for nearly a decade. The large and rapid influx of Syrian refugees into the border cities of Ramtha and Mafraq, home to the Za'atari refugee camp, has strained water supplies to the breaking point — for two weeks in February, parts of Mafraq town had no water whatsoever. Summer's soaring temperatures will put additional demands on a poor region that can hardly support its own population, let alone the surge of new refugees that are expected as the war in Syria grinds on. When the peaceful Syrian uprising evolved into a bloody conflict nearly two years ago, residents of Mafraq welcomed refugees fleeing the violence. That hospitality is starting to wane. Competition between Syrian refugees and local residents over limited resources, from water to electricity, food, schooling, housing and <u>health care</u> could boil over, potentially causing unrest in one of the few stable countries left in the Middle East. "As temperatures rise, so too will tensions," says Nigel Pont, Middle East Regional Director for <u>Mercy Corps</u>, an international development agency actively involved with the Syrian crisis. Resentment among the Jordanians is palpable, he adds, and could easily escalate into violence if the underlying issues are not addressed.

Some 3,000 Syrians are crossing the Jordanian border every day, and aid agencies working with the 363,000 refugees already in the country anticipate that at this rate they will see another million in Jordan alone by the end of the year. Border towns like Mafraq have seen populations double since the start of the Syrian conflict, driving prices for rent, food and utilities sky-high. At the same time, the Jordanian government is considering reducing its historically generous subsidies on fuel. So costs are rising along with demand—a perfect storm for the Jordanian economy that has many grumbling about unwelcome guests.



International assistance can help with food, housing and even fuel to supply Jordan's burgeoning refugee population to a certain extent. Water, however, is the one thing that can't be airlifted in. For decades Jordan has relied on extracting groundwater to supply its own growing population, but those supplies are dwindling. According to antipoverty charity <u>Oxfam</u>, which is also involved with the Syrian conflict, groundwater extraction is nearly three times the recharge rate in some areas, which means that wells are quite literally going dry. To make things worse, Oxfam estimates that <u>50% of water in Mafraq district is lost</u> through leaks in aging pipes or by people illegally siphoning water from the municipal system.

"The Syrian refugee emergency is highlighting one of Jordan's most pressing problems — water," says Christian Snoad, Oxfam's water, sanitation and hygiene coordinator in Za'atari, in a recently released statement. "Solutions need to be found to deal with Jordan's water scarcity, and this will need to be done as a matter of urgency." As it is, towns that used to have running water one day a week are now only getting it once every two weeks. And with more than half of the Syrian refugees living in towns like Mafraq, it's all too easy for Jordanians to blame the newcomers for the shortages. To fill in the gaps residents must rely on water delivered by private tanker companies, a costly alternative that is fueling further resentment.

Aid agencies such as Oxfam and Mercy Corps have dug wells in the Za'atari refugee camp to assuage shortages there, but it's a short-term solution, especially as numbers grow. To help residents and refugees outside the camp, the U.S. Agency for International Development has partnered with Mercy Corps on a <u>\$20 million project</u> to refurbish Jordan's ailing water system where the influx of Syrian refugees has disrupted supplies.

These initiatives will only help if the incoming numbers stay stable, all the more unlikely considering the worsening violence across Syria. The U.K.-based <u>Syrian Observatory for Human Rights</u> says 6,000 Syrians were killed in March, making it the deadliest month since the start of hostilities in 2011. On <u>Tuesday</u>, rebel forces attacked a Damascus suburb in an attempt to reach the heart of President Bashar Assad's stronghold. The regime retaliated with a barrage of rockets, mortars and air strikes on northern suburbs allied with the opposition. It is impossible to predict where the war will go next: the rebels are determined; so too is the regime. But if Damascus does fall, or any of Syria's southern cities for that matter, a surge of Syrians heading for the Jordanian border is a given. Instead



of 3,000 refugees a day, Jordan might find itself forced to accept hundreds of thousands — a catastrophic burden for any country, not least one already on edge because of its own dwindling resources.

**UPDATE**: Jordan's Prime Minister-designate, Abdullah Ensour, warned in parliamentary debate that an increased influx of Syrian refugees would be <u>"catastrophic"</u> for the country. In a subsequent conversation with journalists, he suggested that the government was considering alternatives, including the establishment of <u>buffer zones</u> in southern Syria that would serve the dual purpose of protecting Jordan from spillover from the ongoing conflict, as well as house would-be refugees seeking safety across the border. On 5 April the United Nations warned that it would soon have to start cutting aid to Syrian refugees across the region, due to inadequate funding. "The needs are rising exponentially, and we are broke," Marixie Mercado, a spokeswoman for Unicef, told reporters in Geneva according to the <u>New York Times</u>. "Across the region, a lot of our operations are going to have to start scaling down unless we get money." Unicef warned that it had received only a quarter of requested funds, and as a result would be forced to stop deliveries of 3.5 million liters of water to 100,000 Syrian refugees by June – just when demand will peak.

"Will Syria's Refugee Crisis Drain Jordan of Its Water?", 06/04/2013, online at: <u>http://world.time.com/2013/04/04/how-syrias-refugee-crisis-is-draining-jordans-scarce-water-supply/#ixzz2Pn359MJN</u>

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## \* Iraq Energy Profile: Has Surpassed Iran In Producing Crude Oil

Iraq has the fifth largest proven crude oil reserves in the world, and it passed Iran as the second largest producer of crude oil in OPEC at the end of 2012.

Iraq was the world's eighth largest producer of total petroleum liquids in 2012, and it has the world's fifth largest proven petroleum reserves after Saudi Arabia, Venezuela, Canada, and Iran. Just a fraction of Iraq's known fields are in development, and Iraq may be one of the few places left where much of its known hydrocarbon resources has not been fully exploited. Iraq's energy sector is heavily based on oil. Over 90 percent of its energy needs are met with petroleum (2010 estimate), with the rest supplied by natural gas and hydropower.

Iraq has begun to develop its oil and natural gas reserves after years of sanctions and wars, but it will need to develop its infrastructure in order to reach its production potential. According to estimates by Iraq's Deputy Prime Minister for Energy, capital expenditures of \$30 billion per year in Iraqi energy infrastructure are required to meet Iraq's production targets. Progress has been hampered by political disputes and the lack of a law to govern development of Iraq's oil and gas. The proposed Hydrocarbon Law, which would govern contracting and regulation, has been under review in the Council of Ministers since October 26, 2008, but has not received final passage.

#### Petroleum

Despite having large proven oil reserves, increases in oil production have fallen behind ambitious targets because of infrastructure constraints and political disputes.

#### Reserves

Iraq revised its estimate of proven oil reserves from 115 billion barrels in 2011 to 141 billion barrels as of January 1, 2013, according to the Oil and Gas Journal. Iraq's resources are not evenly divided across sectarian-demographic lines. Most known hydrocarbon resources are concentrated in the Shiite areas of the south and the ethnically Kurdish region in the north, with few resources in control of the Sunni minority in central Iraq.

The majority of the known oil and gas reserves in Iraq form a belt that runs along the eastern edge of the country. Iraq has five super-giant fields (over 5 billion barrels) in the south that account for 60



percent of the country's proven oil reserves. An estimated 17 percent of oil reserves are in the north of Iraq, near Kirkuk, Mosul, and Khanaqin. Control over rights to reserves is a source of controversy between the ethnic Kurds and other groups in the area. The International Energy Agency (IEA) estimated that the Kurdistan Regional Government (KRG) area contained 4 billion barrels of proven reserves. However, this region is now being actively explored, and the KRG stated that this region could contain 45 billion barrels of unproven oil resources.

# Production

Iraqi crude oil production averaged 3 million barrels per day (bbl/d) in 2012, and Iraq passed Iran as OPEC's second largest crude oil producer at the end of the year. About three-fourths of Iraq's crude oil production comes from the southern fields, with the remainder primarily from the northern fields near Kirkuk. The majority of Iraqi oil production comes from just three giant fields: Kirkuk, the North Rumaila field in southern Iraq, and the South Rumaila field.

The Ministry of Oil oversees oil and gas production and development in all but the Kurdish territory through its operating entities, the North Oil Company (NOC) and the Midland Oil Company (MDOC) in the north and central regions, and the South Oil Company (SOC) and the Missan Oil Company (MOC) in southern regions. Production in the northern region controlled by the Kurdistan Regional Government (KRG) fluctuates because of disputes with the central Iraqi government, but independent assessments by FACTS Global Energy and the Middle East Economic Survey suggest that crude oil production capacity in the KRG could reach about 400,000 bbl/d by the end of 2013.

#### **Development plans**

Iraq has begun an ambitious program to develop its oil fields and to increase its oil production. Passage of the proposed Hydrocarbon Law, which would provide a legal framework for investment in the hydrocarbon sector, remains a main policy objective. Despite the absence of the Hydrocarbons Law, the Iraqi Ministry of Oil signed long-term contracts between November 2008 and May 2010 with international oil companies.

Under the first phase, companies bid to further develop giant oil fields that were already producing. Phase two contracts were signed to develop oil fields that were already explored but not fully



developed or producing commercially. Together, contracts for both phases cover oil fields with proven reserves of over 60 billion barrels. If these fields were developed as initially planned, they would increase total Iraqi production capacity to almost 12 million bbl/d, or about 9 million bbl/d above 2012 production levels.

The contracts call for Iraq to reach this production target by 2017. However, these contracts are being re-negotiated to more modest levels, and Iraq is revising its production targets to 9.5 million bbl/d by 2017. However, even these revised targets may be overly optimistic, given delays in developing its energy infrastructure. Iraq has since held a third bidding round for natural gas fields, and a fourth round (with few bids submitted) for fields that contain predominantly crude oil. A fifth round has been scheduled in 2013 for the development of the 4-billion-barrel Nasiriya oil field in Thi-Qar province, together with the construction and operation of a new 300,000-bbl/d refinery.

#### Infrastructure constraints

Iraq faces many challenges in meeting the planned timetable for oil production. One of the major obstacles is the lack of an outlet for significant increases in crude oil production. Both Iraqi refining and export infrastructure are severely constrained, with bottlenecks preventing more crude oil processing. Iraqi oil exports are currently running at near full capacity in the south, while export capacity in the north has been restricted by sabotage, deteriorating pipelines, and the inability to receive more oil from the south of Iraq via a deteriorated Strategic Pipeline. Pipeline capacity would need to be expanded in any case to export significantly higher volumes. Progress has been slow because of political disputes between factions within Iraq, especially those between the central government in Baghdad and the Kurdistan Regional Government. Iraq also has disagreements regarding shared oil fields with Kuwait and Iran.

Production increases of the scale planned will also require substantial increases in natural gas and/or water injection to maintain oil reservoir pressure and boost oil production. Iraq has associated gas that could be used, but it is currently being flared. According to a report issued by the U.S. National Oceanic and Atmospheric Administration (NOAA), Iraq was the fourth largest natural gas flaring country in 2010.



Another option is to use water for re-injection, and while locally available water is currently being used in the south of Iraq, fresh water is a scarce commodity in the Middle East. Large amounts of seawater will likely have to be pumped in via pipelines that have yet to be built for the Common Seawater Supply Facility. It was estimated that 10 to 15 million bbl/d of seawater could be necessary for Iraq's original production expansion plans, at a cost of over \$10 billion. ExxonMobil, which was originally assigned to lead the project, dropped out in 2012, putting these plans behind schedule. The engineering company CH2MHill was subsequently awarded management of the project in December 2012, but the final scope of the project won't be known until Iraq decides what its re-negotiated production targets will be. The IEA estimates that the project will not come online before 2017 at the earliest.

Furthermore, Iraq's oil and gas industry is the largest industrial customer of electricity in Iraq. Largescale increases in oil production would also require large increases in electric power generation. However, Iraq has struggled to keep up with the demand for electricity, with shortages common across the country. Significant upgrades to the electricity sector would be needed to supply additional power. Although over 20 gigawatts (GW) of new generating capacity are planned by 2015, delays in meeting projected targets would mean insufficient supply to meet the projected demands of the oil sector.

#### Refining

Iraqi refineries produce too much heavy fuel oil relative to domestic needs, and not enough other refined products such as gasoline. To alleviate product shortages, Iraq set a goal of increasing refining capacity to 1.5 million bbl/d. Iraq has plans for four new refineries as well as plans for expanding the existing Daura and Basrah refineries.

#### Kurdistan regional government issues

The Kurdistan Regional Government (KRG), the official ruling body of a federated region in northern Iraq that is predominantly Kurdish, has been involved in disputes with national authorities related to sovereignty issues. The plan by Iraq's North Oil Company to boost production at the Kirkuk field in North Iraq at the edge of the KRG region has been met with objections by the KRG, which insists that development plans at this field require KRG cooperation and approval.



More generally, the Iraqi Oil Ministry insists that all hydrocarbon contracts must be signed with the national government, and that all oil produced in the KRG region be shipped via SOMO, Iraq's oil exporting arm. However, the KRG passed its own hydrocarbons law in 2007 in the absence of a national Iraqi law governing investment in hydrocarbons. In late 2011, the KRG challenged the authority of the national government when it signed oil production sharing agreements with ExxonMobil to develop 6 blocks in northern Iraq, some of which are in disputed border areas. The KRG has since signed additional contracts with majors such as Chevron, Gazprom, and Total. ExxonMobil withdrew from some of its projects in Iraq, notably the Common Seawater Supply Facility, and the company had been asked by the Iraqi government to choose between its involvement in the West Qurna 1 oilfield and its projects in the KRG. TPAO of Turkey has also been asked to withdraw from its involvement in the Block 9 concession that was awarded during the fourth bidding round because of disputes regarding Turkey's involvement in KRG energy projects.

Another KRG oil dispute has revolved around exports of crude oil produced in the KRG region from earlier contracts. The KRG had agreed to send 175,000 bbl/d of crude oil into the Iraqi northern oil export pipeline. However, the KRG began reducing their contribution in late 2011, charging that the central government failed to make agreed payments to cover foreign oil company development. The KRG contributions were halted altogether in April 2012, but they were later re-started in August.

Oil exports directly from the KRG are another unresolved issue. The KRG began exporting 15,000 bbl/d of condensate and 20,000 bbl/d of crude oil to Turkey by truck. The KRG is looking at building its own pipelines to export crude oil directly via Turkey, bypassing the national export pipeline system, although Turkey has not officially agreed to this plan. Genel Energy plans to build the 420,000 bbl/d Kurdistan Iraq Crude Export (KICE) pipeline that will connect its fields in the Kurdish regions in northern Iraq to the border with Turkey. In addition, the KRG has explored supplying natural gas to Turkey.

The KRG has ambitious plans for its crude oil exports. KRG Prime Minister Mr. Barzani suggested that crude oil exports from the KRG could average 250,000 bbl/d in 2013 and then rise to 1 million bbl/d by 2015 and to 2 million bbl/d by 2019.



#### **Oil exports**

Iraq was the sixth largest net exporter of petroleum liquids in the world in 2012, with the majority of its oil exports going to the United States and to refineries in Asia.

Iraq exported 2.4 million bbl/d of crude oil in 2012, according to tanker data from Lloyd's List Intelligence. About 2.1 million bbl/d of these exports came from Iraq's Persian Gulf ports, with the rest exported via the Iraq-Turkey pipeline in the north. The majority of Iraqi oil exports go to the United States and to refineries in Asia, especially India, China, and South Korea. Iraq crude oil exports (2012)

#### **Export pipelines**

#### To the North:

Iraq has one major crude oil export pipeline, the Kirkuk-Ceyhan (Iraq-Turkey) pipeline, which transports oil from the north of Iraq to Turkey's Mediterranean port of Ceyhan. This pipeline route consists of two parallel pipelines with a combined nameplate capacity of 1.65 million bbl/d. The Iraq-Turkey pipeline has been subject to repeated disruptions, limiting exports from the northern fields. Furthermore, the parallel pipelines of the Iraq-Turkey route have deteriorated to the point where flows need to be routed back and forth between the two pipelines to bypass deteriorated sections. Only one of the twin pipelines is fully operational, with a maximum available capacity of 600,000 bbl/d, according to the IEA. Finally, in order for this pipeline. However, flows from the Strategic Pipeline have been severely limited, as it is also in need of repairs. Iraq and Turkey have held discussions on increasing pipeline capacity along this route.

Proposals have also been made to build a 1-million-bbl/d pipeline to transport heavy oil via Turkey.

The Kurdistan Iraq Crude Export (KICE) pipeline has been proposed to transport 420,000 bbl/d of crude oil from fields in the KRG to the border with Turkey.



#### To the West:

The Kirkuk-Banias Pipeline, with a design capacity of 700,000 bbl/d, has been closed and the Iraqi portion has been unusable since the 2003 war in Iraq. Discussions were held between Iraqi and Syrian government officials about re-opening the pipeline. The Russian company Stroytransgaz expressed interest in repairing the pipeline, but this plan has not moved forward. Iraq has discussed building several new pipelines to reduce its over-reliance on exports from its southern ports. The first phase consists of building a 2.25-million bbl/d pipeline from Basrah in the south of Iraq northward to Haditha in Iraq's Anbar province. From there, Iraq has proposed building a 1-million bbl/d crude oil pipeline from Haditha to Jordan's port of Aqaba on the Red Sea, with Syria as another potential destination.

#### To the South:

The 1.65-million bbl/d Iraq Pipeline to Saudi Arabia (IPSA) has been closed since 1991 following the Persian Gulf War. There are no plans to reopen this line, and Saudi Arabia has reportedly since converted it to a natural gas line.

#### Ports

The Basrah Oil Terminal (formerly Mina al-Bakr) on the Persian Gulf exported a little over 1.5 million bbl/d of oil in 2012. There are five smaller ports on the Persian Gulf, all functioning at less than full capacity, including the Khor al-Amaya terminal.

Iraqi oil production has been limited by the lack of sufficient export capacity. To address this problem, Iraq initiated the Phase 1 Crude Oil Export Expansion Project (ICOEEP), which envisions expanding Iraqi export capability to 4.5 million bbl/d by building three single-point mooring systems (SPM) with a capacity of 850,000 bbl/d each. The first two mooring systems were completed in 2012. However, exports have increased far less than anticipated because pumping to the SPMs is not coming from the refurbished Fao terminal as planned, but rather from a stop-gap diversionary pipeline. In addition, inadequate storage tank capacity has limited pumping from storage. Another SPM has since been planned to further increase export capacity.



#### Natural gas

The majority of Iraqi natural gas production is flared and Iraq was the fourth largest natural gas flaring country in the world in 2010. Iraq is taking steps to reduce flaring and to use its natural gas resources in power generation and for re-injection to increase oil recovery.

#### Reserves

Iraq's proven natural gas reserves as of January 1, 2013 were the 12th largest in the world at 112 trillion cubic feet (Tcf), according to the Oil and Gas Journal. Over 60 percent of these reserves lie in the south of Iraq. Three-fourths of Iraq's natural gas resources are associated with oil. The majority of non-associated reserves are concentrated in several fields in the North, including Ajil, Bai Hassan, Jambur, Chemchemal, Kor Mor, Khashem al-Ahmar, and al-Mansuriyah.

#### Production

Iraqi gross natural gas production rose from 81 billion cubic feet (Bcf) in 2003 to 660 Bcf in 2011. Some of this natural gas is used as fuel for power generation, while a portion of it is re-injected to enhance oil recovery. However, the majority of Iraqi natural gas production is flared. Flaring losses in some months have exceeded 60 percent of production, or more than 1 Bcf per day, due to a lack of sufficient pipelines and other infrastructure to transport it for consumption and export. As a result, Iraq's five natural gas processing plants, which can process over 773 Bcf per year, sit mostly idle.

To reduce flaring, Iraq signed an agreement with Royal Dutch Shell to create a new joint venture, Basrah Gas Company, to capture flared gas in Basrah Province. The 25-year project costing \$17 billion has a planned production capacity of up to 2 Bcf per day. Under the agreement, processed gas would go to the state-owned South Gas company for domestic use. Any gas not bought for use by Iraqi power plants could be exported as LNG. The agreement, which originally was to cover all of Basrah province, has been modified to include only the associated gas from the Rumaila, Zubair, and West Qurna Phase I projects. Implementation of this agreement is necessary for the new oil development projects (which would use the natural gas for re-injection) to go forward.



#### **Development plans**

Iraq held its third bidding round in late 2010, for three non-associated natural gas fields (Akkas, al-Mansuriyah, and Siba) with combined reserves of up to 7.4 Tcf. Iraq has committed to purchasing 100 percent of the gas. A fourth bidding round in May 2012 attracted one bid for a gas-prone area. The Iraqi Ministry of Oil announced its intention to launch a fifth bidding round for exploratory areas with gas prospects in the future.

#### **Export/Pipeline plans**

Plans to export natural gas remain controversial because natural gas is needed as a feedstock for Iraq's electric power plants. The current shortage of adequate gas feedstock has resulted in idle and sub-optimally-fired electricity generation capacity in Iraq.

Prior to the 1990-1991 Gulf War, Iraq exported natural gas to Kuwait. The gas came from the Rumaila field through a 105-mile, 400-MMcf/d pipeline to Kuwait's central processing center at Ahmadi. The Ministry of Oil has discussed reviving the mothballed pipeline, but no firm plans have been made to do this.

Other possibilities include:

- Developing northern export routes such as the proposed Nabucco pipeline through Turkey to Europe. In July 2009, Prime Minister Nouri al-Maliki suggested that Iraq could export 530 Bcf per year to Europe by 2015.
- Connecting the Iraqi gas grid to the existing Arab Gas Pipeline that connects Egypt's gas grid with those of Jordan, Syria, and Lebanon. Under this plan, gas would be delivered from Iraq's Akkas field to the Turkish border and then on to Europe.
- Building liquefied natural gas (LNG) export facilities in the Basrah region.
- Renewing plans to participate in the Friendship Gas Pipeline, which would transport natural gas from Iran through Iraq to Syria and then on to Europe.

Iraq's export plans have been complicated by KRG proposals to export their natural gas independently of Baghdad.



#### WATER RESEARCH PROGRAMME -Weekly Bulletin-

# Electricity

After years of power shortages, Iraqi efforts to increase generating capacity are moving forward. Iraq plans to triple generating capacity to 27 gigawatts by the end of 2015.

#### Overview

Like many developing countries in the Middle East and North Africa, Iraq faces a sharply rising demand for power. For most of the postwar period 2003-2012, Iraq has struggled to meet its power needs. Daily outages lasting 16 hours per day have not been uncommon. Although Iraq purchased 74 turbines, for a total of 10 gigawatts (GW) of capacity in 2008, no progress in installation was made until recently because of budgetary, contracting, and political difficulties. In addition, enhancements to the transmission and distribution networks are required to bring additional power to customers. A further bottleneck is that, while this power expansion is planned to be fueled primarily by natural gas-powered turbines, the natural gas infrastructure enhancements to support this expansion have lagged.

As a result, Iraq has had to import electricity from Iran and from Turkish electricity barges (floating power plants) in the Persian Gulf. In addition, there has been a large increase in the number of privately-owned generators, with those in Baghdad alone providing an additional 1 GW of capacity.

#### **Development plans**

The Ministry of Electricity is the Iraqi agency responsible for electricity generation, transmission, and distribution. Dr. Abd 'Abd al-Satter, Director General at the Ministry, said that Iraq could triple its generating capacity to 27 GW by 2015. Most of the turbines for this expansion were purchased several years ago, and over 20 new contracts have been signed for construction of power plants. In addition, Iraq plans to spend an additional \$27 billion over the next five years, with about half of the money to be spent on upgrading the transmission and distribution systems. Chinese firms will build 3.8 GW of the new capacity, followed by South Korean and Turkish companies, with the latter dominant in the KRG region.

The majority of the new power plants will be gas-fired, with about 1 GW of diesel generating capacity also scheduled to come online. About 400 megawatts (MW) of wind and solar generating


capacity are planned. However, no new hydropower plants are planned because of water shortages. Iraq is also looking to convert older existing gas-fired plants to more efficient combined-cycle plants.

The expansion of generating capacity will be tied to the development of the natural gas industry infrastructure, which is currently lagging. Most current Iraqi natural gas production is flared, and pipelines will need to be built to bring natural gas, which would otherwise be flared, to future power plants.

In addition, Iraq will need to enact regulatory and tariff reforms. Iraq will need to re-examine its current heavy electricity subsidies in order to prevent future demand growth from out-stripping the expansion in generating capacity. New laws for the electric sector have been proposed, but they are still waiting for cabinet approval.

"Iraq Energy Profile: Has Surpassed Iran In Producing Crude Oil – Analysis", 02/04/2013, online at: http://www.albanytribune.com/02042013-iraq-energy-profile-has-surpassed-iran-in-producing-crude-oil-analysis/

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### ✤ 'Israel cuts water to Palestinian villages'

The Israeli regime has completely cut off water to Palestinian villages in the occupied West Bank, local media say.

Palestinian media reported on Monday that Israeli authorities halted the water flow to 10 villages located northwest of al-Quds (Jerusalem).

According to reports, local Israeli officials had already imposed restrictions on the amount of water pumped to these villages.

Reports also indicated that residents were living on very small amounts of water even before the total halt of water flow.

Locals also said that hundreds of Palestinian students are also suffering from the lack of water in their schools.

The Palestinian NGO, Land Research Centre, also said in a recent report that Israeli settlers from the settlements of Yiztar and Baracha have been using water springs in the Palestinian residents of Burin in order to raise fish.

The Palestinian residents lodged a complaint with Israeli authorities, saying that the settlers use their only source of water, not only for farming but also for their leisure. This is while the Palestinian community suffers water shortages and has to pay extortionate rates for water.

"Israel cuts water to Palestinian villages", 02/04/2013, online at: <u>http://www.presstv.ir/detail/2013/04/02/296166/israel-cuts-water-to-palestinian-villages/</u>

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## **Solution** Entrepreneurs Take on MENA's Water and Energy Challenges

With the Middle East and North Africa's water and energy needs at an all time high, local entrepreneurs must contribute to sustainable solutions.

The World Bank <u>estimates</u> that by 2020 the Middle East and North Africa (MENA) must create 100 million new jobs. Solutions are needed immediately.

By definition, entrepreneurs solve problems. They mobilize scant resources to overcome challenges and produce big results. In MENA, where regulations for starting and scaling a business can be complex, a young crop of startups have been populating the region's markets at a growing rate in recent years. In parallel, new support programs such as investment funds and business incubators have increased in number. The rising commitment to start, support and invest in new companies have many believing entrepreneurship can have a watershed effect on MENA's job creation plans. Quickly, entrepreneurs have been positioned as a go-to solution for tackling the region's unemployment problems.

However, job creation is not the only item on the region's development agenda where entrepreneurs are urgently needed. Water scarcity in MENA is acute: by 2050 per capita water availability will be <u>reduced by half</u>. Further, the United Nations claimed that as of 2007 many MENA countries already existed at a level of <u>scarce or stressed freshwater access</u>. Though the region is home to 6% of the world's population, it has <u>approximately 1%</u> of global freshwater reserves. Of equal concern, new energy sources are essential for MENA's longevity. By some estimates, by 2035 the region will increase its current <u>energy consumption by 70%</u>, occurring against the backdrop of diminishing oil reserves and access to electricity.. These environmental constraints are just as, if not even more, pressing than the employment challenge and they too demand solutions.

The growing know-how and excitement in MENA's entrepreneurship space must also be channeled towards water and energy challenges. Globally, entrepreneurship has played a role in turning environmental constraints into opportunities with startups providing a testing ground for new ideas in the green economy.



A small cohort of MENA entrepreneurs are already working in this space. Identifying them and their companies can help provide a blueprint for others to follow and boost support for green startups.

Saphon Energy was born in Tunisia in 2009 when engineer Anis Aouni and his friend of two decades, investment banker Hassine Labaied, hatched an idea for a blade-less wind converter. This "zero-blade" technology, an innovation that differs from traditional bladed turbines, was inspired by the process sail boats use to capture kinetic energy from wind. The technology has been patented and is being registered in 70 different countries.

Fifteen hundred miles east in Jordan, entrepreneur Mahmoud Shattel's startup Taqetna (Arabic for "our energy") is also tackling the wind-energy space with its "Reyah" prototype. Reyah is a vertical wind turbine customized to meet MENA's wind speeds. Alternative energy is a critical need in Jordan, which currently imports <u>96% of its energy</u>. Though young, Taqetna is an example of how a startup can endeavor to disrupt this field.

Specializing in both the energy and water sectors is Jordan's Millennium Energy Industries (MEI). Launched in 2002, MEI has patented solar desalination and cooling technology with a core focus on solar heating solutions. Between 2008 and 2010 MEI grew over 700% and in 2012 was named Jordan's fastest growing company. In 2011 in Saudi Arabia it engineered and implemented a 25 mega-watt solar heating project - the world's largest - and is now rolling out in the European Union and Chile. Ennis Rimawi serves as MEI's Executive Chairman through his role as Managing Director of Catalyst Private Equity, an Arab region venture capital fund for energy and water technology. The need for stable energy and water access in MENA are clear. Rimawi explains the demand as both a necessity and a market opportunity. The region's harsh environmental conditions make alternative energy and water sources a factor of survival. In parallel, MENA is endowed with business opportunities for green companies. According to some estimates, the region holds 45% of global potential for renewable energy and experiences roughly <u>300 days</u> of sunlight per year. Similarly, market research company Frost and Sullivan values the region's water treatment sector at USD4.7 billion by 2020. These are just a few data points that demonstrate the market opportunity. However, few entrepreneurs in MENA are active in the region's energy and water fields. This could be due to factors including costs for starting up and minimal exposure and support to incentivize more activity. The result is minimal available support for these companies and limited opportunities for others to enter this space.



A handful of actions can be taken to address these gaps.

In the words of Labeid, "There needs to be greater synergy between these people who can innovate and investors who can take a risk." More funds focusing on clean-tech and renewable energy are a must. Business plan competitions and incubators with a focus on these sectors can also spur interest. Similar initiatives already exist for Internet startups and these models can be tailored to the energy and water sectors. Closer alignment between the academic and private sectors will also enhance research and development while simply increasing exposure for players in this field can generate new incentives and interest.

The impact of green startups in MENA could be enormous, playing a pivotal role in bringing new dialogue and technologies to the table. Groups like Saphon Energy, Taqetna and MEI could provide blueprints for others to follow - tailoring technologies to turn MENA's unique challenges into opportunities and demonstrating both why and how young companies can have an impact in this field.

"Entrepreneurs Take on MENA's Water and Energy Challenges", 03/04/2013, online at: <u>http://www.huffingtonpost.com/jamil-wyne/entrepreneurs-take-on-men b 3003679.html</u>

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### St. Agatha Academy students argue case for Palestinian's water rights

For some St. Agatha Academy students, a visit to a mock <u>United Nations</u> has turned into an opportunity to make a real difference to the world.

"We just thought we could participate in a mock UN assembly and talk about problems in the world, and we left with a way to make a real difference," St. Agatha teacher Wendy Berryman said.

Last month, students from the school attended the <u>YMCA</u>'s Kentucky United Nations Assembly (KUNA), an event conducted yearly to allow students to participate in a simulated international diplomatic three-day conference. The students emulate different cultures and attempt to represent the interests of those nations in a mock assembly.

## Finding a way to help

It was the first trip in four years for St. Agatha students, whose group represented <u>Palestine</u>, an area that struggles with a lack of water. The region is considered to have a severe water shortage.

The students' understanding of Palestine's plight caught the eye of Joe Bringardner, the youth outreach and partnership director for WaterStep, a non-profit organization devoted to helping communities have sustainable water solutions.

"He came over and said he saw what we were doing," said Berryman, an advisor for the student delegation. Berryman said Bringardner, who was at KUNA to spread the word about his organization's purpose, spoke to the students and they developed a strong desire to help.

"They've come back with a passionate drive to help," she said.

WaterStep provides solution to the world's water crisis, according to the group's website. The group brings safe water to developing countries or for disaster relief. WaterStep collects old shoes, which it then uses to fund projects such as water purification systems small enough to fit in a backpack. Bringardner wasn't sure if WaterStep could get such a purifier into Palestine, but he could get one in to any of the other WaterStep nations.



"We decided we were interested because it was a way to maybe really help the Palestinians," Harper Sewalls, a St. Agatha seventh grader, said. "This was a way to help and we wanted to do that." For every 2,000 shoes collected, WaterStep can provide one water purification system to a needy country.

That one system can provide water for about 10,000 people.

While Bringardner was trying to generate interest in WaterStep with all the KUNA participants, he really focused on St. Agatha's contingent.

"They were singled out because our kids really understood and conveyed the message of what happens to any people that don't have clean, potable water and access to the water they need," said Tracy Miller, whose daughter Tessa, took part in the KUNA experience.

St. Agatha will have drop-off places for old shoes — anything from high heels to high top sneakers — at St. Joseph Hall on South Main, Winchester First Church of God at 2500 Colby Road and the Presbyterian Church on Bypass Road. The shoes must be in pairs and tied together or held with a rubber band. Even worn out shoes will be taken, as those can be recycled.

# The KUNA experience

The students dressed as Palestinians and tried to get a resolution passed through the assembly to run a water pipeline through <u>Israel</u> to the Dead Sea. While unsuccessful, the students did receive a Delegation of Excellence Award for their presentation, which included a dance and a 13-foot dome that resembled the Dome of the Rock.

The students had met for nearly six weeks to work on the dome. They also learned about Palestine and the country's plight.

"We used PVC pipe and foam boards, and we cut them and painted it all," seventh grader Mac Ertel said.

"I wouldn't know any of this about Palestine (if we had not done this). It was pretty fun, too." "You get more of a global perspective on things," Harper said. "You see how people think of your nation and world views."



Sewalls and Tessa Miller said the St. Agatha group got along with the Israeli delegation, even if the students representing Israel presented a con speech against the Palestinian water line resolution.

"We talked to them and we were cool," Harper said. "It's not like we were mad at each other." KUNA offered a view-broadening experience for the students.

"I love how you get to discover what is happening in every country and other cultures — how they work and what type of government they use and problems they have," Tessa Miller said. "I didn't realize how many people are hungry."

Tessa said her favorite part was the global village, where other structures like St. Agatha's dome were on display.

"Going to the global village and seeing all the structures they had was really cool," she said. "I think it was a good experience."

Harper and Mac also said they would like to return to KUNA if possible.

"A lot of kids who are quiet and reserved got out of their comfort zones," Tracy Miller said. "We had one student who spoke in front of the entire student delegation and it wasn't a student who would normally do something like that. We're so thankful that St. Agatha is a huge supporter of these programs."

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<sup>&</sup>quot;St. Agatha Academy students argue case for Palestinian's water rights", 05/04/2013, online at: <u>http://www.centralkynews.com/winchestersun/news/ws-st-agatha-academy-students-argue-case-for-palestinians-water-rights-20130405,0,4491285.story</u>



## Palestinians building \$1.5bn settlement - without water

A new Palestinian settlement is being built on the hills of Judea and although it lacks water and costs over one billion dollars, it stands as a political statement. The settlement has been largely funded by a grant from the government of Qatar.

TEL AVIV, ISRAEL (Catholic Online) - The Palestinian settlement of Rawabi is being built in Palestinian territory, but remains in full view of Israeli settlements and its only access road and water, must come through Israeli-controlled territory.

Despite the obvious challenges to infrastructure, the settlement costs nearly one-and-a-half billion dollars with most of the money being invested by the government of Qatar. The other comes from private Palestinian investors.

Cranes topped with Palestinian flags are constructing the settlement comprised of high-rise apartments, theaters, shopping malls, and soccer stadiums. The settlement is intended to be modern and middle-class.

However, the flags are galling to nearby Israelis who see the settlement as a political statement - which it is. The Palestinians are saying they are not afraid to assert their claims and to build.

Both sides say they want peace, and recall with revulsion the recent days of conflict. However, neither side is happy with the other.

Palestinians who wish to live in the town will need a permit from the Israelis allowing them to drive to and from the settlement on the only access road.

Water will also need to be piped in through Israel.

Although both sides may look angrily at one another from opposing hilltops, neither side wants conflict. For those investing in the settlement, they will only see returns if peace holds. If conflict



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destroys the settlement, the money sunk into it will be lost.

New polls suggest that as much as 70 percent of Israelis are willing to accept a Palestinian state if it ensures peace.

"Palestinians building \$1.5bn settlement - without water", 03/04/2013, online at: http://www.catholic.org/international\_international\_story.php?id=49975

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## ✤ Egypt: Israel responsible for sewage on Sinai coast

As sewage levels increase along the Sinai coast line, Egypt points it's finger toward Israel.

The Egyptian National Commission for the Protection of the Environment in North Sinai has accused Israel of causing pollution levels to rise in Sinai's coastline, Egypt Independent reported this week.

The commission's head, Abdallah Hijawy, claimed that since Israel's withdrawal from the Gaza strip, Jerusalem has removed major water pumps that were used to stop massive amounts of sewage from reaching Sinai, according to the report.

"In front of the international community, Israel is responsible for the service sector in the occupied lands," Hijawy was quoted as saying, "even the color of the water has changed and the smell is terrible."

According to the report, an increased level of pathogens in the Mediterranean, caused by industrial waste water excreted from Israel and the Gaza Strip, has raised human susceptibility to cancer and other diseases.

Hijawy said he plans to pursue a course of action through an international court, after being told by an Arish court that they had no jurisdiction in international cases such as these.

This is not the first time Israel has been accused by Egypt of interfering with the Sinai coast.

In 2010, reports surfaced claiming that the Israeli Mossad spy agency was being considered by Egypt as the possible perpetrators behind a shark attack which claimed the life of a female German tourist.

"What is being said about the Mossad throwing the deadly shark [in the sea] to hit tourism in Egypt is not out of the question, but it needs time to confirm," South Sinai Gov. Muhammad Abdel Fadil Shousha was quoted as saying by the Egyptian state news site egynews.net.

"Egypt: Israel responsible for sewage on Sinai coast", 06/04/2013, online at: <u>http://www.jpost.com/Middle-East/Egypt-Israel-responsible-for-sewage-on-Sinai-coast-308859</u>

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## **\*** JD5.5 million project to rehabilitate Karak's water network

AMMAN — The implementation of a JD5.5-million project to construct and rehabilitate water infrastructure in the southern Karak Governorate is under way, a government official said on Saturday.

The project entails installing new water networks and rehabilitating deteriorated ones to improve water management and supply in Karak, the Water Ministry's secretary general and acting secretary general of the Water Authority of Jordan, Basem Tulfah, told The Jordan Times in a phone interview.

"The ministry has awarded a tender for installing and refurbishing the water infrastructure in Al Qaser, Arrabeh and Shihan towns in Karak," Tulfah underscored.

The project, which was first announced in 2010, aims at addressing water loss in Karak, where over half the water is lost due to poor infrastructure. Reservoirs, pumping stations and water networks in the southern region will be revamped and constructed, according to the ministry.

The project is part of a national agenda designed to rehabilitate water networks across Jordan and upgrade infrastructure in the south, according to Tulfah, who noted that the project is jointly funded by the government and the German Development Bank, which is contributing 80 per cent of the costs.

"The project is expected to be completed within one year," Tulfah noted.

Water per capita in Karak Governorate stands at 165 litres per day, according to the ministry's spokesperson, Omar Salameh, who said the amount is above the country's average.

Salameh said over the phone that the problem with the water supply in Karak is the deteriorated water networks, conveyance pipes and pumping stations, which lead to the loss of 60 per cent of the supplied water in leakage.



He added that two water projects are currently under construction in Karak Governorate at a total cost of JD9 million, in addition to a JD10 million venture to improve the water supply in the southern governorate.

Karak, located 140 kilometres to the south of Amman, has a population of 170,000 people, according to the Department of Statistics. The governorate is home to several of the country's main wells, streams and dams.

"JD5.5 million project to rehabilitate Karak's water network", Jordan Times, 04/04/2013, online at: <u>http://mideastenvironment.apps01.yorku.ca/?p=7040</u>

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## **\$** \$108m project to revamp Zarqa water network launched

AMMAN — The Millennium Challenge Account-Jordan (MCA-Jordan) on Sunday said it will float the first of six tenders to restructure and rehabilitate the water network in the heavily populated and industrialised Zarqa Governorate on Monday.

The \$108-million (around JD76.5 million) water network project is designed to decrease water loss and increase the amount of water delivered to subscribers, MCA-Jordan CEO Kamal Zoubi said on Sunday.

"The first tender for restructuring primary and secondary pipes in Zarqa and Ruseifa will be floated tomorrow. The following four tenders for restructuring tertiary pipes will be floated in May and June," Zoubi noted.

He said at a press conference that the sixth tender for establishing a reservoir and a pumping station in Ruseifa will be floated in September.

The tenders for the water network project were arranged into six after MCA-Jordan in September last year rejected all bids received to restructure and rehabilitate the water network in Zarqa.

Zoubi said that the bids were cancelled because the offered prices exceeded the allocated money in the grant's budget, which was provided by the US government's Millennium Challenge Corporation (MCC).

"The tenders will be floated in conventional construction packages instead of the previous designbuild packages," Zoubi said, noting that the step will give Jordanian contractors a better chance to compete.

The water network project is part of the \$275-million Millennium Challenge Compact between the US and Jordan, which is designed to further economic growth through expanded access to clean water and sanitation, according to an MCA-Jordan statement.

Over one million people live in Zarqa, 22km east of Amman. The MCC grant was fully allocated to the governorate, which hosts over 50 per cent of the country's industries, because it lacks sufficient water resources and adequate wastewater services, according to officials.

"The project will increase water flow from 62 to 89 litres per capita per day and reduce non-revenue water loss from over 50 per cent to 35 per cent by 2016," Zoubi said.



MCA-Jordan is also implementing two projects in Zarqa, including the wastewater network project, which is designed to extend modern sewage networks to urban areas, and the Samra Wastewater Treatment Plant Expansion Project.

The expansion project seeks to increase the plant's capacity to treat almost all of the wastewater generated in Amman and Zarqa, thus increasing the amounts of treated water which can be used for irrigation of crops in the Jordan Valley.

"Both projects are progressing well," Zoubi said.

He emphasised that the MCA-Jordan projects will restructure the water supply system in Zarqa from periodic distribution under high pressure to more frequent, gravity-fed distribution.

"Around 95 per cent of the tertiary water pipes in Zarqa, where the project is being implemented, need replacement...," Zoubi said.

The water network project's infrastructure work will take around two-and-a-half years to be completed while the remaining years of the compact will be to ensure no defects, he said.

"Construction on the project is expected to commence within three months... the project is scheduled to be completed early in 2016," he told The Jordan Times.

MCA-Jordan was established in 2010 as a company fully owned by the government to manage and implement the MCC-funded programme.

"\$108m project to revamp Zarqa water network launched", Jordan Times, 04/04/2013, online at: http://mideastenvironment.apps01.yorku.ca/?p=7038

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## \* Cairo, Khartoum cooperating on Nile issue: Sudanese FM

Sudanese foreign minister says President Morsi's trip to Khartoum will open door to increased bilateral cooperation between Arab neighbours

Cooperation between Egypt and Sudan over the Nile River is moving in a positive direction, Sudanese Foreign Minister Ali Karti said on Thursday in comments reported by state news agency MENA.

On the sidelines of Egyptian President Mohamed Morsi's visit to Khartoum, Karti told reporters the visit would open new prospects for bilateral cooperation.

There had been tensions between the countries during the Mubarak era.

Sudan is an important ally for Egypt because of its agricultural potential and Egypt's need to secure an acceptable agreement with upstream Nile countries over vital water supplies.

Morsi's two-day visit is the first to Sudan since he was elected president last June. He is holding talks with his counterpart Omar Al-Bashir, along with business people and political party leaders.

According to AFP, Morsi's office said the visit had "particular importance because it is the first of its kind since the president took office, and is aimed at stressing the special and strong strategic relationship between Egypt and Sudan."

Cairo is keen to establish "a real economic partnership with Sudan, to meet the ambitions and goals of growth and prosperity for both peoples," it added.

Morsi's visit would "complete some issues that have already been agreed" when the two leaders held talks in Cairo last September, Bashir's press secretary said.



These include trade integration, transport, investment, and the "four freedoms" pact, which gives citizens of each country the right to freely enter and conduct economic activities in the other. It has not been fully implemented.

The Entebbe dilemma

Karti's comments on the Nile issue came one week after the two-year-old South Sudanese state announced joining the Cooperative Framework Agreement of the Nile Basin Countries, known as the Entebbe agreement.

"We joined the Nile Basin Initiative. We are on the way to joining the framework agreement, through which Nile Basin countries can discuss the best ways to use water sources," Paul Mayom, South Sudan's minister of water resources and irrigation, told a radio station on 26 March.

The Entebbe agreement was signed in April 2010 by Uganda, Kenya, Tanzania, Ethiopia, and Rwanda, and then on 28 February 2011, Burundi became the sixth signatory.

Egypt, the main opponent of the deal, argues that a 1959 agreement, as well as another accord signed in 1929 under British rule, stipulate the approval of all Nile Basin states must be gained before the implementation of any water-utilisation projects.

Egyptian officials have said the new agreement by upstream counties does not affect the legal stance of Egypt and Sudan as downstream states.

However, the six countries that signed the Entebbe agreement reject such reasoning, and remind the Egyptians that the 1929 and 1959 agreements are "void and invalid" because they were written and ratified under British colonialism.

Egypt, which receives the largest portion of the Nile's water, has rejected any deals that do not preserve its "historic rights."



Egypt's share of Nile waters is 51 billion square metres annually, according to a deal signed with Sudan on 1959, which gives the latter 18 billion square meters of water per year.

"Cairo, Khartoum cooperating on Nile issue: Sudanese FM", 05/04/2013, online at: http://english.ahram.org.eg/NewsContent/2/8/68500/World/Region/Cairo,-Khartoum-cooperating-on-Nile-issue-Sudanese.aspx

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## \* Egypt's Morsi says no Nile River crisis, fears abound

CAIRO and ADDIS ABABA: Egyptian President Mohamed Morsi on Saturday attempted to dispel fears that rifts were continuing to create tension between Egypt, Sudan and the rest of the Nile Basin countries. His comments came after months of wrangling after a report suggested Egypt was ready to attack Ethiopia's Grand Renaissance Dam project if it went forward.

"Egypt's ties stumbled in the past, but now we are together, with possibilities of enhancing cooperation that satisfies the interests of all sides," Morsi told reporters at the end of a two-day visit in Sudan.

"Mutual talks in this respect are currently ongoing, and we welcome the restoration of old relations with Africa," Morsi added.

However, he did not talk specifically about the demands of other Nile Basin countries, including Ethiopia, which has long pushed to have their own rights to the world's longest river. Sudan and Egypt are seen as two allies and stalwart in their antagonism against other Nile River countries, especially concerning any dam projects.

Despite Egypt and Sudan's war of words against Ethiopia and the dam project, Addis Ababa has said it will go forward with the project as part of its energy needs.

A source close to the Ethiopian government and those responsible for the massive Nile Renaissance Dam project has told Bikyanews.com that the government is expected to increase efforts to push forward on the construction of the large dam project that has left Egypt and Sudan frustrated.

"It is serious that the government here is looking to increase productivity on the dam project," said the source, who has worked in the higher levels of the Ethiopian government over the past two decades. "It is a result of the public antagonism that has been leveled at Ethiopia over Nile water and what is believed to be the right of any nation to use its resources for the betterment of its own society."



It is the latest in the ongoing battle for the world's largest river's water, with Egypt and Sudan continuing to remain obstinate in amending any of the colonial treaties that guarantee their countries with a lion's share of water from the Nile.

Wikileaks released documents this month that revealed Egypt and Sudan had been planning to attack an Ethiopian dam project to "protect" their rights over Nile water based on colonial era treaties.

In documents revealed by Wikileaks, the Egyptian and Sudanese government appeared ready to develop a launching pad for an attack by Egypt against the dam.

Wikileaks has leaked files allegedly from the Texas-based global intelligence company, Stratfor, which quote an anonymous "high-level Egyptian source," which reported that the Egyptian ambassador to Lebanon said in 2010 that Egypt "would do anything to prevent the secession of South Sudan because of the political implications it will have for Egypt's access to the Nile."

"Egypt's Morsi says no Nile River crisis, fears abound", 06/04/2013, online at: <u>http://bikyanews.com/87144/egypts-morsi-says-no-nile-river-crisis-fears-abound/</u>

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### \* Egypt Wants to Fortify Ties with Sudan

Egyptian President Mohamed Morsi has met with Sudanese leaders in Khartoum, vowing to solidify ties between the two countries, which at one time were united.

President Morsi received applause from a crowd of worshippers at a mosque in Khartoum, where he addressed them following Friday prayers.

It was Morsi's first visit on a tour of countries with which Egypt shares a land border. He told his audience that he intended to reopen that long-closed land border in several places to strengthen what he termed "unity" between the two countries.

Morsi said that Egypt and Sudan are one nation, share one Nile River, one sense of purpose, and one leadership with the same goals. He insisted that Egypt wants what he calls the Nile Axis of world development between the Arabs, Islam and Africa to be a source of rebirth, but that this cooperation and unity is not aimed against anyone.

Morsi said Egypt and Sudan have "agreed to reopen road links between them to the east of the Nile" and that ultimately that would lead to reopening other roads between the two countries "to join the manpower and production capacities of both nations."

The Egyptian president told businessmen earlier, in a joint meeting with Sudanese President Omar al-Bashir, that he wanted to "increase investments between the two countries."

Veteran Egyptian editor and publisher Hisham Kassem says that Morsi's previous trips abroad have not been overly successful and that it was not clear exactly what he intended to accomplish by visiting Sudan:

"It's a zero-sum foreign policy. None of his international visits have amounted to anything. He goes to China claiming that it's going to balance out American influence in the region. Do you think China will risk meddling in the area of influence of the United States? And now we see him going to Sudan. He's talking about increasing trade and investments. What are we going to increase trade in, cayenne pepper and camels and goats?," Kassem said.

Kassem added that one major issue that concerns both countries is the longstanding demand from Nile basin states for Egypt to reduce its share of water from the river. But, he says, there are people "far better qualified" than Morsi in the Egyptian military and intelligence community to negotiate the issue.

Both Egypt and Sudan were once united, under the Egyptian monarchy. Khartoum



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gained formal independence in 1956. The two countries have had rocky relations since an attempt to assassinate former President Hosni Mubarak in Addis Ababa in 1995. The Egyptian press accused Sudan of being responsible for the attempt.

"Egypt Wants to Fortify Ties with Sudan", 05/04/2013, online at: <u>http://www.voanews.com/content/egypt-wants-to-fortify-ties-with-sudan/1635618.html</u>

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WWW.ORSAM.ORG.TR

Mithat Paşa Caddesi 46/4 Kızılay-Ankara TURKEY Tel: +90(312)4302609 Fax: +90(312)4303948 orsam@orsam.org.tr



# \* Qat in the middle

Sometimes I miss the eco-reps of freshman year. I miss the "Green Dorm Room" sign that my roommate and I earned by virtue of living in a non-air conditioned room with a broken radiator. I miss the free, metal water bottles. I miss having a representative vouch for my right to live with paper AND plastic recycling bins in my common room. What do you think?

Despite all these fond memories, I managed to live an entire year on East Campus, befriending ecoreps, without seeing a single change in sustainability practices at Duke. There are better tasks for the environmental advocate at Duke than telling fellow freshmen, "Make it a quickie! Turn off the tap." So I have a suggestion for those of you who aren't ready to be done preaching about Mother Earth: Pack up your water conservation stickers and your enthusiasm and head east about 8,000 miles. Get excited, you're headed to Yemen!

It seems slightly unfair that a nation plagued by al Qaeda in the south and extremists in the north should also have to worry about turning off the faucet while they brush their teeth. The sad reality of the matter, however, is that Sana'a, the capital of Yemen, is on its way to becoming the first capital in the world to run out of a viable water supply. With 1,200 miles of coastline, desalination plants seem to be a necessary and reasonable solution to desertification. Despite the obvious need, it's hard to tell one of the poorest and least developed nations in the world that they just need to suck it up and invest over \$1 billion in a desalination plant like their wealthy neighbors, the Saudis.

Water scarcity is particularly crippling in a chaotic nation like Yemen. The centralized government of Yemen has been in a state of flux since the departure of Ali Abdullah Saleh in 2012; even during his tenure, the northern and southern regions of the nation maintained their own basic autonomy. Any sort of environmental policy is near impossible to enforce, and education about water issues is somewhere between nonexistent and poor. Beyond the government's inability to do much about it, water scarcity allows for the perpetuation of the very anarchy and violence that has plagued Yemen in its time as a post-colonial nation. Violence over wells and water sources in the north and south is incredibly common, so rural Yemeni citizens often welcome the order and security that al Qaeda or extremist groups like the Houthis can provide. In some areas of the highlands, water tables can drop between 10 and 20 feet annually. It's no shocker, then, that these same areas are disproportionately likely to be external to the control of the central government.



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So what's behind this great water crisis? You don't have to dig very deep to find its root. In line with its level of development, 64 percent of Yemen's workforce works in agriculture. This sector receives a whopping 90 percent of the domestic water supply and 37 percent irrigates a nonessential crop: qat. Qat is a mild psychoactive stimulant that is an indelible aspect of daily habits in Yemen. The average Yemeni man chews qat for eight hours a day, spending his afternoon with a bulging cheek, regardless of whether he's farming, relaxing or in a session of the consultative assembly. The time spent chewing qat and the lackadaisical attitude associated with the activity are often blamed for the backwards and undeveloped nature of Yemen. A Yemeni journalist, Ali Saeed al-Mulaiki, joked prior to the revolution of 2012, "If the Yemeni people didn't chew qat, they would think about their future and about their lives, and there would be a revolution."

Despite the fact that qat appears to be an all-around negative for the nation, it doesn't have an appropriately poor reputation within the country. The ranks of qat-chewers are now expanding to include women, which is sometimes seen as a mark of feminism and progress. Anywhere else, this would be considered the expansion of a nation of addicts—breaking the methamphetamine glass ceiling in the American Midwest was never a triumph of the National Organization for Women. Like connecting your extra minute in the shower to the extinction of the polar bears, it's hard to think of your daily bag of qat as a contributing factor to the strength of al Qaeda in the Arabian Peninsula. The drug itself isn't harmful enough to prompt the same treatment as crops like opium, yet the ancillary effects are not discountable. When it comes down to it, qat is a water-intensive crop that earns its cultivators more money than other crops like grains. No blame can be placed on a Yemeni farmer for selecting the more lucrative endeavor, and this pattern will continue unless there is drastic change in qat demand or the management of water in the nation. So eco-reps, unite! There's some water out there not getting the respect it deserves.

"Qat in the middle", 03/04/2013, online at: http://www.dukechronicle.com/articles/2013/04/03/qat-middle

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# ✤ Water rationing to stay: WRA

LIGHT RELIEF: Some parts of the nation have had heavy rains over the past two days, but not enough to lift water restrictions yet, the Water Resources Agency said

First-stage water rationing measures already in place in parts of the country with depleted reservoirs will likely be maintained until the end of this month, despite heavy rains in the past three days, an official said yesterday.

Water Resources Agency (WRA) deputy head Tien Chiao-ling (田巧玲) said that even with the recent rains, it was too early to lift the first-stage measures.

Officials will hold their next meeting on the nation's water situation on Wednesday and are likely to keep the measures in place until at least late in the month, Tien said.

Taiwan's driest spring in 58 years has left some parts of the nation scrambling to conserve water as shortages loom.

Taoyuan County and Linkou District (林口) in New Taipei City (新北市) in northern Taiwan, and Greater Kaohsiung in southern Taiwan have implemented first-stage water rationing measures, which reduce water pressure to consumers between 11pm and 5am, since March 22.

Parts of northern, central and southern Taiwan reported accumulated rainfall of more than 80mm between early Wednesday and Thursday afternoon, but it did little to replenish reservoirs with relatively low water levels.

As of 2pm yesterday, Shihmen Reservoir, which supplies water to Taoyuan and Linkou, was filled to 43.35 percent of its capacity, up from 42.48 percent late on Tuesday night.

However, the Agongdian Reservoir, which supplies water to Kaohsiung, saw its water reserves fall during the same period to 41.48 percent from 42.46 percent of capacity, according to agency figures.

Most of the heaviest rainfall was concentrated in central Taiwan, and while it brought welcome relief to some reservoirs there, it also caused damage in mountainous Nantou County.

Rockslides on several sections of a road in Renai Township (仁愛) blocked traffic as of Thursday morning and sporadic landslides were seen on Provincial Highway 21, but the rocks and debris were later removed.

Weather observation equipment on Yushan  $(\Xi \mu)$  was destroyed by lightning late on Wednesday and has not yet been repaired, according to the Yushan Weather Station.



#### WATER RESEARCH PROGRAMME -Weekly Bulletin-

Lin Yuan-pong (林元鵬), deputy head of the WRA's South Region Water Resources Office, said that although the recent rains brought some relief to Taiwan's dwindling water supplies, the general public is still urged to conserve water.

"Water rationing to stay: WRA", 06/04/2013, online at:

http://www.taipeitimes.com/News/taiwan/archives/2013/04/06/2003558934?utm\_source=Circle+of+Blue+WaterNews+ %26+Alerts&utm\_campaign=08edf35dc8-RSS\_EMAIL\_CAMPAIGN&utm\_medium=email

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## Septage : Kerala's Looming Sanitation Challenge

Kerala is a beautiful state in South India, home to about 34 million people, many of whom share my pride as a Keralite. Of all the states in India, Kerala scores the highest on the human development index, has one of the highest literacy rates in India (around 95%), a low Infant Mortality Rate, gender ratio in favor of the female population, stunning landscapes (highlands, mid-lands, low-lands), and a booming tourism industry. It is God's own country, as the promoters of tourism industry has named it.

While India has the highest number of people defecating in the open in the world, the state of Kerala has a large number of households with their own toilets (96% coverage). However, by solving that problem, the communities now have another. With household access to toilets high and most connected to septic tanks, periodic emptying of septic tanks is essential. And, if the septage is not safely disposed of, and is dumped into open streams/rivers, paddy fields and other areas, contamination of drinking water sources is possible.

People don't want to discuss this "dirty" business, but it's an issue that must be addressed. On-site sanitation seems to be the only solution since a very small percentage of the state is connected to sewer networks. For most of Kerala, sewer networks are practically difficult because the cities in the state are already densely inhabited and the homestead pattern in villages is typically a continuous spread with very little separation between rural and urban areas.

When the government approached the World Bank to help address this issue, I wanted to see firsthand the current practice. Little did I know that I was signing up for an exciting midnight mission. I contacted some private septic tank cleaners in Kochi (commercial capital of the State and a bustling city), who invited me to come along with them and at 10 p.m. we started our late night assignment. At the first house in an upper-class neighborhood, a well-dressed man came out of the house to quickly show the location of his septic tank, pay the contractor and then immediately retreated back to the house. My guides for the evening, a three-member team (a driver and two workers), said it is common that their customers didn't want to see the business of emptying fecal matter from their septic tanks. The workers, the typical 20-somethings who usually do this job, also explained to me the work, in spite of its stigma, is highly rewarding. Each worker makes about \$20USD a night, about twice as much as most other workers of their age and category. I was pleased to find that the workers



appear to be from diverse backgrounds, basically the same as would be found undertaking other types of manual labor.

The work of emptying septic tanks is mainly done in the middle of the night from 10 p.m. -5 a.m. This is because it is essentially a clandestine activity as they have to dump the collected sludge in any available open space, a practice that is done under the cover of darkness. The State has no facility for treatment and disposal of septage collected from the septic tanks. Though open dumping of septage is illegal, in the absence of facilities to receive septage from the private operators and treat it for safe disposal, the law enforcement agencies are finding it difficult to regulate and control open dumping. There are more than 25 private operators with more than 60 vehicles (each with a capacity of 5,000 liters) working daily in and around Kochi. Rough estimates indicate that they collect about 600, 000 liters of sludge daily, all of which is getting discharged in the open environment without any treatment.

The open dumping of septage has become a major issue for Kerala and a threat to its progress. While open defecation means fecal matter is spread around in smaller quantities, septage dumping means discharge of highly concentrated pathogens with potential to cause significant health and environmental damages. Local newspapers are frequently reporting on incidences of septage dumped in water bodies and paddy fields and villagers agitating against illegal dumping, even sometimes beating up the workers of the operators, citing the plight of villages where septage brought from cities is contaminating their drinking water sources.

Along with an increase in news coverage, newspapers are also seeing an increase in advertisements for the septic tank cleaning business, which is flourishing. Five years ago you would have seen two or three ads, and now you regularly see around 15 operators advertising their services in the classified column of the newspapers. With business booming and the public discourse growing increasingly heated, regulation and finding solutions are even more important.

Not only is there a public health risk due to the open dumping of septage, but there are also significant economic costs. Kerala has a high morbidity rate and a high incidence of water borne diseases. Costs to families include expenditure on boiling water (a very common practice even in restaurants, where you will be offered boiled water), time lost due to illness and medical expenses, among others.

There is a Public Interest Litigation in the Courts on this issue and the State Government has given an undertaking in the Supreme Court of India that the State will develop proper treatment and disposal



facilities for septage management within three years. We are now helping the State Government to develop a strategy to address the issue and is also providing support to the World Bank's Second Kerala Rural Water Supply and Sanitation Project (Jalanidhi – II) in piloting a regional septage treatment facility in one district. The lessons we are developing have a great deal of potential for application across India; reflecting the high population density of Kerala, the Ministry of Urban Development has shown a strong interest in our work and we are already working with the ministry to extract lessons learnt and develop a national septage management policy.

While I love all of my assignments across India, most of which are in the Northern States where economic and social conditions are often below the national average, it is a source of great satisfaction to me to be able to work on a program which promises to make a material difference to the environment of my home state and to the well-being of fellow Keralites. The time to act is now as otherwise the gains of improved access to sanitation will be negated by the open dumping of septage, not only in Kerala, but across all India.

"Septage : Kerala's Looming Sanitation Challenge", 03/04/2013, online at: <u>http://blogs.worldbank.org/water/septage-kerala-s-looming-sanitation-challenge</u>

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### Political risk deters action to avert famine – report

LONDON (AlertNet) - Governments are failing to prevent hunger emergencies in developing nations, despite ample warning, because they see more political danger than reward in acting early to avert famine, a report from the Chatham House thinktank said on Friday.

To prevent further food crises like those that hit millions of people in the Horn and Sahel regions of Africa in the past two years, the misalignment between political and humanitarian risks must be addressed, or aid needs will increasingly go unmet because drought-related hunger is affecting growing numbers of people in Africa, <u>the report</u> said.

"Rapid population growth, low levels of political inclusion, low agricultural yields and rapid environmental change mean the risk of food crises in the Horn and Sahel is increasing," said the report from the London-based Royal Institute of International Affairs. "Conflict and geopolitics act as risk multipliers, meaning that full-blown famine remains a serious threat."

Drought-related food crises are the most deadly of all natural hazards and are estimated to have cost between 1 and 2 million lives since 1970.

The report explains why the international aid community is still dragging its feet on early warnings, even though these have improved considerably. For example, alerts were issued for 11 months before famine was finally declared in Somalia in July 2011, and the relief system was mobilised, it said.

One of the main reasons was political, as Western donor nations feared their aid could end up supporting the Islamist militant group al Shabaab, considered a terrorist organisation by Washington, according to the report. "From a donor perspective, the risk of humanitarian aid being captured by al Shabaab took priority over the risk of a humanitarian catastrophe in Somalia," it said.

Another worry for wealthy governments is being accused of wasting taxpayers' money on a crisis that never happened, said Rob Bailey, senior research fellow at Chatham House and the report's lead author.



"That results in a set of funding institutions and decision-making processes in donor agencies, the U.N. and NGOs that seek to minimise those (political) risks at the expense of not really dealing with the risk of famine at all," he told AlertNet.

In practice, this means centralised decision-making, onerous reporting systems, delays in releasing aid cash until it is too late, and a lack of willingness to experiment with new ways of doing things, Bailey added.

But the blame does not only lie with the international community, the report said.

## SHAMED INTO ACTION

Governments in countries at risk of food crises are also guilty of ignoring warnings and playing down the severity of a situation. That may be because they don't want to harm their record on reducing hunger, or because they have little incentive to protect vulnerable communities which are often politically marginalised.

In 2011, when poor, sparsely populated northern Kenya was hard hit by drought, Nairobi was widely criticised for its slow response. The government was eventually spurred into action, partly by a campaign launched by Kenyan media and businesses encouraging the public to make donations via mobile phone, Bailey said, pointing to the potential for a free press and civil society to make a political difference.

Similar dynamics were at work internationally when, soon after, more than 18 million people across West Africa faced a major food crisis.

"In the case of the Sahel last year, there was very clearly a big sense of shame about what had happened in the Horn of Africa and particularly Somalia, and people were openly talking about the need to show that we've learned lessons," Bailey said. This led to a certain amount of early action that prevented a downward spiral into famine, he added.



"It worked in a way, but I don't think fundamentally anything has changed in terms of the underlying institutions, the operational capacities. It was about managing political risks rather than anything else, and on that occasion the political risk calculus favoured early action," the food security expert said.

The report suggests reforms that could generate greater political will for early action on food crises. Key recommendations include making governments more accountable to vulnerable groups, and supporting communities to protect themselves from drought and hunger.

A larger share of international emergency response funds should be channelled into preparing for and avoiding disasters, and more long-term backing given to innovative ideas such as drought insurance, Bailey said.

The report calls for the development of "resilience labs" where governments, aid agencies and early warning providers could team up to test new approaches and demonstrate success.

Donor countries could also work out a better system for sharing the responsibility to act on warnings and responding in a more coordinated way. And they could communicate to their voters at home that acting to prevent a crisis costs less than waiting for it to happen, Bailey said.

"The trickier stuff is how you shift incentives so that decision makers are going to be properly rewarded for taking decisions to respond early, and feel that they have cover in the event that those decisions - every now and again - prove not to be necessarily the right ones," he said.

"Political risk deters action to avert famine – report", 05/04/2013, online at: <u>http://www.trust.org/alertnet/news/political-risk-deters-action-to-avert-famine-report/?utm\_source=Circle+of+Blue+WaterNews+%26+Alerts&utm\_campaign=08edf35dc8-RSS\_EMAIL\_CAMPAIGN&utm\_medium=email</u>

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# Ending Open Defecation, Not by Evidence Alone

Open defecation – going outside without using a toilet or latrine – is one of the most important threats to child health and human capital, period; ending it must be a policy priority. Do you believe us? You should. A diverse, rigorous range of evidence is accumulating, indicating that open defecation kills infants and stunts the growth of young bodies and minds. New research in biology, medicine, and economics is coming together to resolve old puzzles and to document solutions.

Whether or not you will believe us could be another matter. Evidence alone is rarely enough to attract attention to overlooked causes or to ensure decision-makers select the right solutions. That is where partnerships between governments, researchers like Dean, and programs like WSP, the World Bank's multidonor partnership program to increase water and sanitation access for the poor, come in – partnerships that can translate evidence into persuasive and useful knowledge that makes for better policy.

## The evidence: Sanitation, stunting, and child health

Over a billion people worldwide defecate in the open. This amounts to almost one in five people in developing countries not using any toilet or latrine.

We're making a big mess. But beyond the ick factor, feces are full of germs. This means that widespread open defecation fills the environment that surrounds children's homes with ready sources of disease. These germs accumulate in children's intestines. Not only do fecal germs cause diarrhea, research now points to the greater importance of chronic intestinal disease. Such disease causes changes in the lining of children's intestines that make it harder for the body to use the nutrients that children eat – even without necessarily manifesting as diarrhea.

Because early-life development is such a critical period, any net nutritional deprivation keeps children from growing to their bodies' potential heights. And because the same health and nutrition that help bodies grow tall help brains grow smart, this analysis suggests children exposed to open defecation in the environment do not reach their cognitive potentials, either. This leads to an adult workforce that is less economically productive and less healthy – all for lack of putting feces in a safe place.

Height is an important indicator of a child's well-being. Surprisingly, researchers have long been puzzled by the fact that average height differences across developing countries are not well explained by differences in income. For example, the average person in India is wealthier than the average person in Africa, but Indians are shorter on average. Moreover, this difference cannot be due to genetic factors.

A Policy Research <u>Working Paper</u> by Dean offers open defecation as an explanation. The paper considers several angles, but the key message is found in the figure shown. Each circle represents one county in one year; in fact, they are collapsed rounds of USAID's Demographic and Health Surveys. The vertical axis is an indicator of the average height of children under three; the horizontal



axis measures children's exposure to fecal germs: how many people openly defecate per square kilometer.

The downward trend is clear: countries where children are exposed to more fecal germs have shorter children. Indeed, open defecation per square kilometer can linearly explain 65% of all cross-country variation in child height in these data. Moreover, open defecation can statistically explain the puzzle of Indian stunting: with both poor sanitation and high population density, Indian children face a double threat.

## The rest of the iceberg: Fluency and trust

So, there is growing evidence that policy-makers concerned about children's health and human capital should concentrate on reducing open defecation. But statistical evidence may not be enough to empower policy change – especially if it sits in academic journals.

The World Bank Group's global reach allows us, through the range of our financial and knowledge products, to help deliver these important messages from academic research in a timely and intelligible fashion to policy makers, translating high level knowledge into practical solutions which are relevant for the development challenges that policy makers grapple with every day. Clever experiments from the psychology of persuasion and influence demonstrate that more than a good argument is needed to create change.

For example, people are often unimpressed by complex arguments. "Fluency" is the ease with which a text can be mentally processed. Arguments might be disfluent because they are written with unnecessarily big words, or merely because they are printed in a hard to read font. Psychologist Danny Oppenheimer found in an experiment that not only do readers given the same text written more complexly rate the "author" as less intelligent, light printing from a low toner cartridge can have the same effect. What is the connection? Both make a text harder to mentally process. Oppenheimer won an Ig Nobel prize for documenting, as he puts it, the "consequences of erudite vernacular utilized irrespective of necessity." But the problem is no joke. Researchers are trained to speak precisely in technical language. For people like Dean, speaking econometrics is actually easier than talking normally – running the risk of missing the chance of delivering an important message in the brief meetings covering many topics with senior policy makers. People often talk about "translating" research into policy; sometimes the translation is literal.

Further, many researchers build a career by publishing many papers on a range of topics. Professionally, they have little incentive to maintain relationships with one department's ministers and secretaries who will cycle onto other jobs next year. However, research shows that people are persuaded by those we like and trust – especially those with whom we have developed relationships. It is no accident that Danny Oppenheimer, remembered and mentioned above, is Dean's former psychology teacher.

These are ties that organizations like the World Bank Group, and programs like like WSP can build and maintain. However, for such an organization to be trusted, it cannot offer only glitzy persuasion: it must build a history of responsibly selecting the right arguments to advance. Finally, no statistical argument can fully substitute for the practical wisdom of years of practical experience, which we can integrate with the latest research. Practical experience, gained on the ground with government



officials of all ranks, not only serves to ensure that the World Bank Group understands the issues, it builds confidence that we will be there for the implementation.

## **Impactful evaluations?**

More than ever, development economics research is concerned with clear statistical demonstrations of cause and effect. Development organizations are encouraged to conduct "impact evaluations" – often in partnership with academic researchers.

It is important to think carefully about the impact of impact evaluations. We are far from the first to observe that even the best evaluations will have little impact if trusted partners and peers do not make them accessible to policy-makers. Impact evaluation is neither an evaluation of the people implementing a program, nor need it be an assessment of value for money, but rather an additional benefit for all concerned to help shape future activities. Like many organizations these days, we are learning the value of knowledge brokers and evidence producers working together. And as we learn together, we will be spreading urgent knowledge of the alarming consequences of widespread open defecation.

"Ending Open Defecation, Not by Evidence Alone", 04/03/2013, online at: <u>http://blogs.worldbank.org/water/ending-open-defecation-not-by-evidence-alone</u>

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### China dams 'won't affect flow to India'

Allaying apprehensions over construction of three dams by China on the Brahmaputra (Yarlung Tsangpo in China), Union Water Resources Minister Harish Rawat on Friday said the "run-of-the-river" projects would not impact water flows on the Indian side.

He said the issue had been taken up by India at the highest level. Prime Minister Manmohan Singh and Chinese President Xi Jinping discussed it on March 8, on the sidelines of the BRICS summit in Durban. While China maintains that these constructions are run-of-the-river projects, India has sought a joint mechanism and greater transparency from China.

Highlighting some of the major concerns of the government including growing pollution of rivers, drought in Maharashtra and other States, the Minister told journalists here that the new National Water Policy was aimed at dealing with these challenges.

Answering a question on use of huge quantities of water in Maharashtra for maintaining the grounds for IPL matches, Mr. Rawat said the Centre could only advise the State that water was precious and should be used judiciously. To another question on interlinking rivers, he said it was a long-term programme and consent of States was essential.

"China dams 'won't affect flow to India", 06/04/2013, online at: <u>http://www.thehindu.com/news/national/china-dams-wont-affect-flow-to-india/article4585700.ece</u>

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### \* China projects not to affect Brahmaputra's flow: Rawat

New Delhi, April 5 (IANS) China has assured India that it will not take any step which affects the downstream flow in Brahmaputra, Water Resources Minister Harish Rawat said here Friday, noting that the neighbouring country had planned only run-of-river projects.

Rawat, who was addressing media in connection with the India Water Week to be held here April 8-12, said the issue of dam construction by China over Brahamputra had been discussed at the highest level with the Chinese government.

"There is no need to be panicky. Whatever construction, it is small run-of-river projects," Rawat said, adding such construction will hardly affect the flow in Brahmaputra.

The minister said China had assured India that it will take "no such step" which impacts the river's downstream flow.

China had unveiled plans for construction of three new hydropower dams on the middle reaches of the Brahmaputra river in January this year. The three new dams were approved by its state council under a new energy development plan for 2015.

Rawat said President Pranab Mukherjee will inaugurate the second edition of India Water Week April 8 on the theme of efficient water management. The president will also launch the new National Water Policy, he added.

The minister said the event will see participation of nearly 1,760 individuals and organisations from over 64 countries. Over 200 papers will be presented during the conference and an exhibition will also be held.

Answering queries, Rawat said his ministry had studied suggestions of standing committee on the dam safety bill and sent the legislation to the law ministry for its view.

He also said the government was concerned about the drought situation in Maharashtra and had released Rs.1,000 crore for water projects in the state.

He said the government was paying attention to the cleanliness of Yamuna and had agreed to construct a canal parallel to the river which will not allow any sewage to flow into it.

The minister said a meeting of the Yamuna Water Board will be called soon.

He said the government wanted to raise the storage capacity in reservoirs from about 250 billion cubic metre at present to 450 bcm by 2050.

Rawat said the ground water situation was critical in nearly 800 blocks in over six states.

"China projects not to affect Brahmaputra's flow: Rawat", 05/04/2013, online at:

http://www.newstrackindia.com/newsdetails/2013/04/05/234--China-projects-not-to-affect-Brahmaputra-s-flow-Rawat-.html

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### Environmentalists struggle to stop Chinese dam project

A decade after activists stopped a project to dam the Nujiang River, one of their largest achievements is set to be undone.

<u>HONG KONG</u>, China — Nearly a decade after Chinese environmentalists achieved one of their greatest successes by stalling plans to build 13 dams on the Nujiang, one of China's two remaining free-flowing rivers, the "angry river" is under threat again.

Earlier this year, the government announced it would help power the country's densely populated, industry-heavy eastern seaboard by re-instating a project to build five new mega-dams along the Nujiang and several other waterways in China's biologically rich southwest.

Flowing nearly 1,800 miles from the Tibetan plateau through southwestern Yunnan Province into Thailand and Myanmar — where it's known as the Salween — the Nujiang supports an estimated 25 percent of China's plant and animal species, many of which are found nowhere else in the world.

Near the Burmese border, the Nujiang slices a 13,000 foot-deep gorge through some of the world's most dramatic mountain landscapes.

American University professor Judith Shapiro, author of China's Environmental Challenges, calls the plans a "tremendous symbolic setback" for China's environmental activists, for whom protecting the Nujiang has been a signature cause.

"Their creative and sustained mobilization to save one of the world's most beautiful rivers represented the maturation of Chinese environmentalism," she says.

Proposals to dam the Nujiang date back to 2003, when officials in Yunnan Province devised plans to construct a massive hydropower complex to produce more power than the controversial Three Gorges Dam, the world's largest.

The project would have required thousands of people — many of them minorities — to be relocated from the river's steep slopes.

Critics feared their compensation would be inadequate and that the environmental impact studies for the project were flawed. Activists took villagers who would have been affected to see existing resettlement sites that had failed.



The tactics helped produce a backlash severe enough for the authorities to take the rare step of tabling their plans. Damming the Nujiang, Prime Minister Wen Jiabao announced, would be halted until the completion of a "careful examination" of its impact.

Ten years on, Beijing's reversal is prompting public surprise and exasperation, some of it on Weibo, China's version of Twitter.

"Nujiang hydropower plans have come back to life?" wrote Weibo user Ludoweixi in a typical post. "If the Nujiang River gets angry [*nu*], they also won't be able to survive."

Among the most serious threats, geologists say, is dangerous seismic activity, thanks to the Nujiang's position along a fault line. Creating reservoirs by damming the river, they warn, would court certain disaster.

In 2011, a group of geologists wrote the government to warn that the area's frequent landslides, earthquakes and downpours created such "high seismic and geological risks" that "large dams should not be built here."

The battle over the Nujiang is taking place against the backdrop of an enormous surge in China's energy appetite and concomitant boom in dam construction. The country has built more than 88,000 dams since 1949, 22,000 of which stand taller than four stories — more mega-dams than any other country.

The conflict also shines a light on a fundamental dilemma in China's development: how to balance the burgeoning need for energy with the kind of environmental protection increasingly demanded by the middle class.

That's why the government may see the Nujiang project as indispensable despite its controversy.

Ed Grumbine, a scholar working in Yunnan, says the desperate need to reduce emissions in one of the world's most polluted countries has put China "between a rock and a hard place" when it comes to hydropower development.

"Energy demand is still going up steeply — maybe 9.5 percent growth this year — and coal is still number one," he says. "So this means the government has to max out all other options to keep carbon



emissions down. Every sector is under pressure to grow — nukes, wind, solar, hydro — and yes, coal. As a result, all China's rivers are at risk — and will no doubt be developed."

Others believe the authorities must explore different options. Katy Yan, China program coordinator at the International Rivers organization, says the country should do more to develop wind and solar resources and increase energy efficiency.

"Hydropower isn't going to solve China's rising demand for energy," she says. "What's more important and a harder question is talking about China's fundamental demand for energy, and measures that can deal with the demand."

The impact of China's energy hunger will be felt beyond its borders. Some 7 million people in neighboring Burma and Thailand live in the Nujiang's lower basin, which would almost certainly be affected by the construction of five dams upriver.

Beijing's unilateral change of course reveals a disregard for China's smaller, southern neighbors, American University's Shapiro says.

"Sadly, the Nu River dams also represent China's big-power disrespect for the equitable sharing of water with downstream neighbors in Southeast <u>Asia</u>," she says, "where China's control of the headwaters of the major rivers that provide livelihoods to millions is creating a deep sense of unease."

Environmentalists are currently pinning their hopes on trying to torpedo the plans again before construction begins in earnest in 2015. Yan of International Rivers says Chinese NGOs are coordinating efforts to draw attention to the dams' potential negative impact.

The main challenge, Grumbine says, is to convince ordinary people that defending a free-flowing river is more than a peripheral concern.

"The Nu is more special to foreigners," he says. "As an undammed river, it fits our value set of wildness being good to protect. Folks living in the Nu are much more utilitarian than that."

"Environmentalists struggle to stop Chinese dam project", 01/04/2013, online at: <u>http://www.globalpost.com/dispatch/news/regions/asia-pacific/china/130328/china-nujiang-river-dam-environmentalists</u>

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### Indian states fight over river usage

MAGIZHI, India — MAGIZHI, India — Valan, a rice farmer in a starched white shirt and sarong, walked along the bone-dry canal bed next to his village in the state of Tamil Nadu as though it were a road. The canal should have been full from last June until the end of the year, he said, but it stood dry, except for one month in which unexpected storms flooded the canal and destroyed his crops.

In the past, "we could just use the rainwater," said Valan, who like many Tamils has only one name. "But the rains are becoming more unpredictable, so certainly the river is becoming more important."

Valan was referring to the Cauvery, a 475-mile river that supports farmers in three southern Indian states. After the poor monsoon last year, the river became the subject of a bitter legal battle that drew in the nation's Supreme Court and ended only in February with a federally mandated water-sharing deal between Karnataka, the state in which the Cauvery begins, and Tamil Nadu, its downstream neighbor.

As India's economic growth drives a rising thirst for water, and with its annual rainy season projected to become increasingly erratic in coming years because of climate change, many states across the country are fighting over their shared rivers. In the west, a tribunal has been working since the fall to find a solution to three states' claims on the Mahadayi, or Mandovi, River. Another tribunal is trying to solve two eastern states' dispute over the Vansadhara.

There are similar <u>tensions on an international level</u>. Manmohan Singh, India's prime minister, last week asked China for more openness about its plans to build dams on the Brahmaputra, a vast Himalayan river that flows into India from the Tibetan region of western China.

India's river disputes "have become more severe, and they will continue to become more severe," said Ashok Jaitly, who sits on a national government committee that is drafting a law on water management. "Water use is increasing, but the supply is fixed."

With India ruled by a fractious coalition government, state-level spats can destabilize national politics. The dynastic Congress party, which leads the coalition, controls fewer than half of the country's 28 states and relies on alliances with regional parties, which often put local and populist



causes first. The river disputes are one such example, said Tushaar Shah, a senior fellow at the International Water Management Institute, a research group headquartered in Sri Lanka. "I do think [the disputes] are getting worse. It's become a political issue, and state politicians are always playing to the galleries."

One regional party from Tamil Nadu recently left the Congress-led coalition after the federal government refused to alter foreign policy to fit its demands.

India will need 1.5 trillion cubic meters (396 trillion gallons) of water per year by 2030, about double its existing supply and more than a fifth of the projected global demand, according to a <u>2010</u> report from the International Finance Corp. and the consulting firm McKinsey & Co. Yet as the population swells, India's water supply per person is dropping. The country has an annual average of 1,545 cubic meters (408,145 gallons) of water available per person, <u>according to India's 2011</u> census — qualifying it as a "water-stressed" nation under World Bank criteria.

That growing thirst is driven by agriculture, with about <u>90 percent of the country's water used in</u> <u>farming.</u> India, home to 1.2 billion people and set to overtake China as the world's most populous country by 2025, has a surging demand for food. Rice, a national staple, requires up to 1 million gallons of water per acre — double the amount needed for wheat.

Rising incomes also mean that more people can afford costly and water-intensive items such as meat and dairy products. New factories and thermal power stations are further pushing up water usage.

## Wasted water

In Tamil Nadu, rain shortfalls before and after a bout of damaging storms caused almost half the crops in the 1.6 million-acre Cauvery delta — an area known as South India's rice bowl — to fail or to produce low yields during January's harvest, according to the delta's farmer welfare association.

Magizhi's farmers are getting by on government handouts. They say they have received about \$184 per acre of failed crops. The state government is also distributing free rice from its grain stores.



After its complaints last year that Karnataka was diverting water from the Cauvery, Tamil Nadu recently also asked the federal government to stop the neighboring state from <u>diverting water from</u> <u>the Ponnaiyar</u>, another interstate river, according to local newspaper reports.

However, even as India's states fight over their rivers, experts say that there is enough water to go around but that much is being wasted. Farmers, who account for more than half the population and constitute a vital voter bloc, receive irrigation subsidies and use cheap water imprudently, experts say.

"The traditional farmers think that the government has a responsibility to give them water, and they don't take care to use it efficiently," said S. Ranganathan, the general secretary of the delta's farmer welfare association, though he added that many farmers are adapting.

In urban areas, rivers and lakes near booming but unplanned cities are often contaminated. Shah, the International Water Management Institute senior fellow, said India's problems with water availability are "being overplayed."

"It's more to do with how you manage the water than how much you have," he said. "There are many countries that are doing much better with less water, such as the Middle Eastern countries."

Some Indian states are starting to encourage or compel efficiency, Shah said. Karnataka has raised water prices in some cities. Gujarat, a western state, has limited farmers' access to electricity for irrigation pumps to eight hours a day. But with a dozen states facing votes this year or the next, and a national election due by May 2014, politicians are unlikely to enact more curbs that affect farmers.

## **Erratic monsoons**

Ranganathan said the Cauvery dispute is far from finished. Although the spat between Karnataka and Tamil Nadu had been rumbling at a low level for several decades, he said, it is likely to keep flaring up in the coming years as India's rainy season becomes more erratic.



The annual monsoon on which India's farmers depend is becoming more unpredictable, according to <u>rainfall data</u> for 1901-2004. A mix of dry spells and sudden downpours, rather than the traditional uninterrupted weeks of rain, is becoming more common.

Environmentalists have warned for years that India is particularly at risk from such phenomena, which they link to global warming. "The Himalayan glaciers are receding, agricultural yields are stagnating, dry days have increased, patterns of monsoon have become more unpredictable," Jairam Ramesh, the minister of environment and forests at the time, told the Mint newspaper in 2009. "So, we are seeing the effects" of climate change.

As for this year's water-sharing pact, the problem "is that it does not contain a formula for sharing water in situations of distress — when the monsoons fail," Ranganathan said. "But there is every chance that the idea of distress will become a permanent part of how we share out the water."

"Indian states fight over river usage", 02/04/2013, online at: <u>http://www.washingtonpost.com/world/asia\_pacific/indian-states-fight-over-river-usage/2013/04/01/73026ae0-9895-11e2-b68f-dc5c4b47e519\_story.html</u>

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## Check dams to recharge water table

### Municipalities to monitor rainwater harvesting structures

The Department of Agro-engineering has proposed to construct 240 check dams, mostly across forest streams in the hill tracts of the district this year. Ground water depletion and the sharp dip in foodgrain output owing to monsoon failure have made water storage and rejuvenation of the ground water table a top priority.

The check dams will be constructed in four blocks – Chinnamaur, Bodinayakkanur, Periakulam and Kadamalaigundu-Mayiladumparai – to aid in the percolation of rain water.

Sixty check dams will be constructed in each union, said S. Selvaraj, Assistant Engineer, Department of Agriculture Engineering in Kadamalaigundu-Mayiladumparai union.

Decades of drawing ground water using water pumps had depleted the water table in many areas. Check dams will be constructed in these areas to recharge water resources and raise the water table.

Check dams will make it possible for farmers to access water for irrigation. They will help solve the drinking water needs of animals and prevent their intrusion into human settlements in Varushanadu hills in Kadamalaigundu union, he added. Check dams near villages will meet the drinking water needs of cattle and help farmers in rain fed areas raise two crops a year.

The rise in the water table will automatically recharge the irrigation wells, he added.

Check dams across supply channels will slow down the accumulation of silt in major dams and maintain storage levels.

The worrying factor is that the State government has scaled down the sanction amount for construction of a check dam to Rs.1.34 lakh from Rs.1.4 lakh.

Contractors will find it difficult to meet overhead costs, said officials in the department.

Around 865 development works, mostly desilting supply channels, irrigation tanks and 'kanmais and 'uranis', were being implemented under MGNREGS to improve water storage facilities in rural



areas. The main objective was not to waste a single drop of rain water, said Collector K.S. Palanisamy.

The municipalities were also advised to monitor rainwater harvesting structures in residential, commercial and government buildings to ensure maximum rain water harvesting. Summer rain will be crucial for solving the acute drinking water crisis, he said. 'Constant monitoring of existing rainwater structures in rural and urban areas is necessary to ensure proper harvesting of rain water," he added.

"Check dams to recharge water table", 03/04/2013, online at: <u>http://www.thehindu.com/news/cities/Madurai/check-dams-to-recharge-water-table/article4577093.ece</u>

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### \* One river, two countries, too many dams

Chinese reticence about projects on its stretch of the Brahmaputra do not assuage Indian fears about diversion of the river's waters

By raising the Brahmaputra dams construction issue during his first meeting with the new Chinese President Xi Jinping, Prime Minister Manmohan Singh was following a two-pronged strategy.

On the one hand, Dr. Singh wanted to bring India's unease with Chinese construction on Brahmaputra's main channel to the world's notice. On the other, by saying publicly that most Chinese projects might not store water, he was trying to ensure that any ensuing debate in the country does not snowball into one more round of panic-stricken news reports.

The Chinese government has been reticent about dams being constructed on transborder rivers. India is not alone in seeking these details. Many lower riparian South East Asian countries and even Kazakhstan in Central Asia want China to be more forthcoming about plans to build dams or divert water from transborder rivers.

Even though some of the dams India is concerned about have recently figured in the Chinese government's plan documents, for a long time open source literature, satellite reconnaissance and source reports were unable to confirm their actual impact on river flows, thus raising anxiety levels here.

During a press conference on his way back from Durban where he met the Chinese President and sought a joint mechanism, Dr. Singh was careful to add a caveat. While confirming that he had asked for greater transparency from China, the Prime Minister added that the projects on the main channel of the Brahmaputra appeared to be run-of-the-river, that is, they would not have significant storage.

Perhaps he was keen to avoid the alarm of media reports on China's plans to divert 40 billion cubic metres of water from the Brahmaputra (known as Yarlong Tsangpo in China) in 2003. The Chinese have put the brakes on the project or perhaps shelved it, but India's apprehensions found another outlet when, a few years later, a massive landslip blocked portions of the river at an area known as the Great Bend. The misgivings were quelled after water cut a course through the blockade and flows returned to normal.

In both cases, the Chinese shared little information about the developments. India kept hoping that its diplomatic notes and media exposure of Beijing's aversion to sharing details would make the problem go away. It was only a couple of years back that China agreed with the Indian request (and separately to that of some Asean states) to share hydrological data.



But another concern had arisen by then. Prime Minister Manmohan Singh first raised it with then Chinese President Hu Jintao in March, 2012. The Chinese were already aware of India's concerns as then Foreign Ministers S.M. Krishna and Yang Jiechi had discussed it in their preparatory meeting before Mr. Hu's visit.

When Dr. Singh and Mr. Krishna spoke about dams on the main channel of the Brahmaputra, only one was at the active-construction stage and information was still coming in about the others. Since then, India has got a firmer fix on a series of three dams on the main channel of the Brahmaputra.

The three dams — Jiexu, Zangmu and Jiacha — are within 25 km of each other. More ominously for strategic experts fixated on the China threat, they are 550 km from the Indian border. But the first one, Jiexu, has been independently confirmed to be a run-of-the-river project which will not impound water in a large reservoir. Construction on the second in the series, Zangmu, began in 2010 and Indian authorities are not sure if this will be a pure RoR variety. The third, a 320 MW dam, will be built at Jiacha, about a dozen km downstream of Zangmu, and even this is more or less confirmed to be run-of-the-river.

These are not the only ones about which India has not been adequately informed. A dam near Zhongda and another near Phudo Zong, as well as 30 other projects were planned and executed with Beijing disclosing little to India.

India's fears about diversion of waters of the Brahmaputra have not been completely assuaged. It deploys high-end technology and spends considerable money on keeping a keen eye on water conductor systems and basins adjacent to Brahmaputra for clues on constructions of canals to take the water away to China's north-western provinces.

## ADDED WORRY

The dams have added another area of worry, more so because there was an increase of eight sites in August last year since the previous assessment was made in 2011. Mr. Xi's reply was a near copy of the answer given by his predecessor three years back. Both had assured all projects were of the runof-the-river variety. By adding that Beijing would examine the proposal, Mr. Xi has given hope for movement on a joint mechanism to share information about construction activities on the Brahmaputra.

Due to the low level of political trust, it has been tough for countries of the region to be forthcoming about their plans for hydroelectric projects. The India-Pakistan skirmishing over dams in north Kashmir is well known. Two cases went for international arbitration. Experts are still sorting out what a recent award means for the viability of a dam being built by India.



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With Bangladesh, India was coy for years about parting with information. Things changed after Sheikh Hasina set about quelling India's security related fears by extraditing militants from North Eastern outfits and discouraging anti-India activity by third-country intelligence agencies. Today India has offered Bangladesh an equity stake in the Tipaimukh Dam in Manipur. It was lack of information on this dam that earlier led to a public agitation in Bangladesh and for a time made the High Commissioner the most unpopular Indian in Dhaka. Bangladesh has now sought joint participation in nine more projects.

China would be wary of conceding the demand for a joint mechanism precisely to avoid just such an escalation of demands by India. On the other hand, as the border issue is unlikely to be settled in the near future, this limited cooperation on water — without prejudice to the upper riparian state on any further demands — would be an easy way to increase political capital between the two countries.

Till then, Dr. Singh's second prong — of not raising unnecessary alarm that may spill over to other areas of discord — must be put in operation. The first step would be to accept the Brahmaputra Inter Ministerial Expert Group's recommendation for an informed public debate to ensure that discussions veer to the possibility of joint management of river basins common to several countries.

"One river, two countries, too many dams", 02/04/2013, online at: <u>http://www.thehindu.com/opinion/op-ed/one-river-two-countries-too-many-dams/article4570590.ece</u>

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# **\*** Rethinking Food Security: the Right to Food in the Mekong

What do we mean when we talk about a right to food? What does such a right involve for individuals? For communities?

These were some of the questions that arose during a recent conference I attended on Food Security in the Mekong - The Water, Food and Energy Nexus Revisited, in Chiang Rai, Thailand. The conference gathered together a number of key groups and researchers in the region and presented cutting edge data around food security challenges and threats looming for the Mekong basin. The threats to the right to food are both important and increasingly urgent. Communities in the Lower Mekong Basin (LMB) countries (Laos, Cambodia, Vietnam and Thailand) are likely to suffer food shortages in coming years due to factors such as changing climate and weather patterns, sharp population growth and shifting patterns of production and consumption. While the rich and fertile environment of the Mekong wetlands is naturally abundant in food resources, there are challenges around who has access to these and whether this access is in qualities sufficient to sustain human nutrition and well-being.

# Dams, food and people

These issues are all thrown into sharp relief against the backdrop of a planned series of eleven hydropower dams on the Mekong mainstream, creating an increasingly stark arena for the above factors to play out.

The Xayaburi dam in northern Laos is the first in the proposed cascade of large scale hydropower projects on the mainstream of the Mekong below China, with subsequent projects intended for Pak Beng, Luang Prabang, Pak Lay, and Sanakham in northern Laos; Pak Chom and Ban Koum on the Thai-Lao border; Lat Sua and Don Sahong in southern Laos; and Stung Treng and Sambor in Cambodia (see map). An additional 77 dams are planned along the complicated Mekong tributary system that threads through the lower basin. Up to 21 dams are planned or are already in operation on the upper parts of the Mekong River, or the Lancang as it is known in China. The net impacts from the dams will have drastic implications for food and nutrition for 65 million people in the Mekong basin, around two thirds of whom are people in rural communities who depend on the river for their livelihoods and survival.

The Mekong is a biodiversity hotspot for fish species and houses the most intensive capture fishery in the world: over one million tonnes of freshwater fish are caught annually in Cambodia and Vietnam, mostly on a small scale by local fisher-folk who have lived in this way for generations.

The dams will cause a dramatic reduction in fish migration, meaning far fewer fish available in the river's capture fisheries. Loss of fish catch signals major changes in available food protein for the populations of all four lower Mekong countries. Hardest hit will be Cambodia and Laos where



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communities depend heavily on fish consumption for their protein needs and other food elements vital to human nutrition. In Cambodia fish represents 80% of all animal protein consumed. Substantial drops in fish protein in the diets of local people is likely to have very serious implications for nutrition in the basin, and if not addressed will lead to rampant malnutrition and related diseases. The impacts will be more severe for pregnant women and children, potentially causing widespread developmental problems in coming generations.

In addition to the loss of fish and other animal and non-animal food sources because of changes to river and wetland eco-systems, the dams will result in other significant impacts on food availability and livelihoods. Reduced sediment flows in the river, for example, are likely to produce major effects on the fertility of agricultural areas downstream, disrupting the rich rice yields from the Mekong Delta region in Vietnam, often referred to as Asia's rice bowl, which feeds millions of people.

Recent studies have shown that it will be extremely difficult to replace the vital elements of human nutrition currently obtained through fish consumption with other food sources. While these options have not been fully explored, research suggests that resource challenges and land scarcity mean replacing protein with reservoir fisheries or raising other livestock or protein rich crops is very unlikely.

Yet the dams are proceeding. On 8 November 2012 construction of the Xayaburi dam officially began with a 'groundbreaking ceremony' at the site and in January 2013 the project developer indicated that the project was already 10% complete.

In the absence of other choices, a further option is for local people to adapt their current subsistence livelihoods to a cash based economy and rely on imported food to replace lost nutrition. Again, the feasibility of this has not been properly studied, but it would mean huge and lasting changes to the lifestyle patterns, social arrangements and cultural practices of peoples whose lives have been intimately entwined with a free flowing Mekong for generations.

The decision-making process around the Xayaburi dam has been marked by a distinct lack of consultation by project developers and <u>participation by downstream countries</u> and <u>affected</u> <u>communities</u>. Policy decisions reflect a one-sided emphasis on economic development and benefit at the expense of the needs and interests of local peoples who will be most affected. Moreover, there are no clear development plans in Laos on how the revenues for the dams will be used to supplement the livelihood and diets of the dam affected communities. With so much at stake for the well being of communities, will their say in the way in which they access food, or their ability to access adequate food at all, be any different?



## What does this mean for the way we talk about food?

There's been ongoing debate in recent years around the respective meanings of 'food security' and 'the right to food.' Discussing the difference between these terms might seem like word play or idle semantics. But it has vital implications for rural communities in the Mekong basin.

After all, food is fundamental. The way in which communities can obtain and access food is likely to change the way they live, work, interact and develop social relationships. It is inextricable from people's sense of dignity and control over their lives.

Developed at the 1996 World Food Summit, the most widely recognized definition of states:

"Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life".

This definition includes a number of important elements. It shows that to be food secure people need both physical and economic access to food; food needs to be safe, nutritious and fit the food preferences and needs of people in question. These elements have to continue over time.

The problem is that this definition doesn't take into account power structures or differentials in the level of control and say people have in policy decisions which intimately affect their lives. If you have little or no say in the type of food you receive or the way it reaches your plate, even if it meets nutrition requirements or is deemed suitable by someone else, it is hard to say that you are food secure.

Debates over food challenges in the Mekong need to move beyond the concept of 'food security' towards a model based on the **Right to Food**. The <u>UN Special Rapporteur on the Right to Food</u> has defined this as: "the right to have regular, permanent and unrestricted access, either directly or by means of financial purchases, to quantitatively and qualitatively adequate and sufficient food corresponding to the cultural traditions of the people to which the consumer belongs, *and which ensures a physical and mental, individual and collective, fulfilling and dignified life free of fear.*" - Report of the Special Rapporteur on the right to food, Jean Ziegler, A/HRC/7/5, paragraph 17 (italics added).

This definition sees access to food as an essential question of human rights. It is important to not only guarantee access, availability and suitability of food, but to recognize the connection between obtaining food and human dignity and fulfillment, through the ability to participate in decisions about how to provide food for oneself, one's family and one's community.

Some groups have gone further, conceptualizing the right to food in terms of **Food Sovereignty**. This term was coined by members of <u>La Via Campesina</u>, a global movement of peasants, farmers and



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indigenous peoples. It focuses in particular on the community and collective elements of the right to food stated above: the right of peoples to define, develop and control their own sustainable food systems as they see fit.

Discussions around food security and the relationship between economic, energy and food policies in the Mekong need to be re-imagined in terms of an individual and collective right to food for marginalized groups, such as the indigenous and rural communities of the Mekong basin. This would place the people and communities who produce and consume food at the centre of decision-making, rather than at the periphery, where they are now shut out of policy decisions by the dominant demands of markets and economies.

"Rethinking Food Security: the Right to Food in the Mekong", 03/04/2013, online at: <u>http://www.earthrights.org/blog/rethinking-food-security-right-food-</u> <u>mekong?utm\_source=feedburner&utm\_medium=feed&utm\_campaign=Feed%3A+EarthRightsInternational+(EarthRightsInternational+)</u>

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### Mekong region facing six degree-warming, climate extremes

[BANGKOK] Temperatures in South-East Asia's Lower Mekong Basin are set to rise by up to three times the global average temperature increase, according to a USAID-funded study.

Previous reports by the Intergovernmental Panel on Climate Change predicted that the basin would see increases in line with the global average of around two degrees Celsius.

But according to a preliminary report by the Mekong Adaptation and Resilience to Climate Change Project (Mekong ARCC) released last week (29 March), parts of the basin could see annual temperatures increase by as much as six degrees Celsius by 2050.

It also predicts that areas such as Mondulkiri province in Cambodia could experience doubling of the number of days with heavy rainfall, up from just nine days annually.

The authors of the study — a complete version of which will be released in May — warn that if local communities do not adapt, their crop yields will fall significantly, causing severe food insecurity.

"We've found that this region is going to experience climate extremes in temperature and rainfall beyond anything that we had expected," says Jeremy Carew-Reid, the study's lead author, and director of the International Centre for Environmental Management, one of the organisations tasked with implementing the five-year project.

The Lower Mekong Basin, which encompasses most of Cambodia and Laos, and parts of Thailand and Vietnam, is primarily rural, with 70 per cent of its 60 million inhabitants working as farmers or fishermen.

But as temperatures increase, the region's suitability for certain crops and aquaculture will change. Farmers could find that yields from crops that once thrived, including staples such as cassava, will plummet.

In low elevation zones in Laos, for example, higher temperatures and more rain could make cassava less suitable for cultivation. In the higher elevation provinces of Cambodia, rainier wet seasons and



more arid dry seasons could hamper the production of Robusta coffee, an important cash crop in the region.

Despite the gravity of their predictions, the Mekong ARCC team remain optimistic they could help local communities adapt to environmental changes by ensuring the study's information is made available to them.

"Our goal now is to take the science and link it to the changes that are taking place in Lower Mekong," says Paul Hartman, Mekong ARCC's chief of party.

"These communities have dealt with environmental shocks for ages, but we want to give them the best scientific information so they can start planning their future but without the scientists telling them what to grow or not," he adds.

Olivier Joffre, an agriculture specialist at Mekong ARCC, says that creative methods could be used to adapt to climate change. He says Vietnamese coffee farmers could plant shade trees to protect coffee bushes from high temperatures, and recommends that cassava farmers in Cambodia avoid peak summer heats by moving their growing season.

While some areas will have to struggle with the reality of a warming climate, others, especially in the north, could see the transition as a boon to their economies, the authors say.

For example, while the study forecasts that most provinces would see the yield of their rain-fed rice farms decline, in the Sakon Nakhon province of northeast Thailand, more rainfall could double rice production by 2050.

"Mekong region facing six degree-warming, climate extremes", 02/04/2013, online at: <u>http://www.scidev.net/en/south-east-asia/news/mekong-region-facing-six-degree-warming-climate-extremes.html</u>

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# ADB - Asian Development Bank : Mekong Countries Seek Greater Cooperation on Green Agriculture

Agriculture and environment officials from GMS countries met to discuss ways to conserve land and water resources while increasing the productivity and profitability of agriculture.

XIENGKHOUANG, LAO PDR - Senior agriculture and environment officials from the six Greater Mekong Subregion (GMS) countries met today to discuss environmentally sustainable agriculture and natural resource management in the region.

Agriculture remains the backbone of economies in the GMS and directly supports the livelihoods of nearly 200 million people. However, agriculture gains have come at the expense of the environment, causing forest and biodiversity loss, water pollution and shortages, soil degradation, and greenhouse gas emissions.

"Agriculture cannot afford to continue undermining the healthy natural ecosystems it relies on. We must create opportunities to use more environmentally friendly approaches that simultaneously conserve land and water resources and at the same time increase the productivity and profitability of agriculture, particularly for small-holder farmers," said Javed Mir, Director of the Environment, Natural Resources and Agriculture Division for the Asian Development Bank's (ADB) Southeast Asia Department.

Delegates discussed opportunities for increased collaboration between the Working Group on Agriculture and Working Group on Environment, co-hosts of the event and two of nine working groups under the ADB-supported GMS Economic Cooperation Program. Both working groups must work together to tackle the growing concern for water scarcity, climate variability and volatility, and consequent rising risks of food and ecosystem service supply disruptions.

More than 130 participants attended the meeting, including officials from energy, transport, and tourism ministries, as well as representatives from ADB and development partners, national development organizations, and other stakeholders.



On Wednesday the two working groups will hold their annual meetings, followed by a joint field trip on Thursday to visit environmentally friendly agriculture projects in Xiengkhouang, one of the 'green' provinces in Lao People's Democratic Republic (Lao PDR).

In late 2012, both working groups began implementing the second phase of their flagship initiatives: the \$14 million Core Agricultural Support Program, and the \$23.1 million Core Environment Program.

The six Mekong countries are Cambodia, People's Republic of China, Lao PDR, Myanmar, Thailand, and Viet Nam.

Since 1992, the GMS Program has invested more than \$15 billion in subregional roads, airports, railways, power facilities, tourism infrastructure, and disease prevention.

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<sup>&</sup>quot;ADB - Asian Development Bank : Mekong Countries Seek Greater Cooperation on Green Agriculture", 02/04/2013,online at: <u>http://www.4-traders.com/news/ADB-Asian-Development-Bank-Mekong-Countries-Seek-Greater-Cooperation-on-Green-Agriculture--16592405/</u>



# \* Climate change to affect Mekong production

Climate change will have a significant impact on major industrial and food crops in the Lower Mekong basin countries of Cambodia, Laos, Thailand and Vietnam, says a new study.

BANGKOK, April 1 (UPI) -- Climate change will have a significant effect on major industrial and food crops in the Lower Mekong basin countries of Cambodia, Laos, Thailand and Vietnam, says a new study.

The study, conducted by the Mekong Adaptation and Resilience to Climate Change Project for the U.S. Agency for International Development, marks the first step of the project's aim to help communities in the four countries to develop local climate change adaptation assessments and action plans.

Considered one of the most fertile areas of Southeast Asia, the Mekong basin is known for its production of rice and maize. About 70 percent of the basin's population of 60 million people earns a living as farmers and fishers.

"Our study is producing very surprising results," said Jeremy Carew-Reid of the International Center for Environmental Management, lead author of the study, in a statement. "We've found that this region is going to experience climate extremes in temperature and rainfall beyond anything that we expected."

While climate scientists generally agree that an average annual temperature increase in the Earth's temperature to 2 degrees Celsius -- 3.6 degrees Fahrenheit -- is the critical threshold for climate change, the study indicates that some areas in the basin could experience temperature increases that are double that by the year 2050.

As a result, the Lower Mekong countries will experience "dramatic changes" in land suitability for some industrial and subsistence crops, USAID says.

"As the climate changes, decision makers will need to consider how they prepare for the future," said USAID Regional Mission Director Michael Yates.



The Mekong ARCC project, he said, aims to help promote planning for food security and economic development by using science to minimize the risks to communities and countries so they can withstand the impact of climate change on agricultural production.

"Adaptation to climate change does not just mean shifting from one crop to another," says Paul Hartman, director of the ARCC project, Climate News Network reports.

"It also means being aware of potential changes, looking out for warning signs that these changes are beginning to occur, and being prepared to respond."

Aside from the looming danger of climate change, plans to build a series of mega-dams across the river to generate electricity also pose a threat to the Mekong countries, experts say.

International Rivers, a non-government organization in the United States, says there are 11 mainstream dams and scores of tributary dams planned on the Mekong.

"By blocking the transport of sediment, the dams will contribute to even greater erosion in the fertile Mekong Delta, which is already threatened by increasing saltwater intrusion as a result of rising sea levels," Aviva Imhof, the group's campaigns director told Voice of America.

"Climate change to affect Mekong production", 01/04/2013, online at: <u>http://www.upi.com/Business\_News/Energy-</u> <u>Resources/2013/04/01/Climate-change-to-affect-Mekong-production/UPI-54261364842799/</u>

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## Laos: Development wins; human rights, environment lose

Last November I <u>posted</u> about China's controversial dam project on the Mekong River in Laos and how it could be catastrophic for the environment and the locals who depend on the river for their livelihoods.

Despite local concerns and international opposition from neighboring Vietnam and Cambodia (as well as the US) citing the ecological repercussions and resulting humanitarian crises the hydropower project could usher in, construction of the Xayaburi dam has gone ahead.

# From China's Global Times:

Construction of the dam started late last year and is now 10 percent complete, but it has been the source of concern for various environmental groups, NGOs, and governments. These groups have argued against the construction of the dam because of a perceived potential for a negative impact on the migratory paths for the Mekong's many fish species and the impacts on sediment flows down the river which provide fertile soil for agriculture along the river.

The Lao government and the heads of the Xayaburi project argue in favor of the benefits the dam will bring. Laos, a poor country, sees hydropower as its cash cow. It will export electricity generated by the dam to neighboring Thailand. Project directors also claim that they have addressed many of the environmental and humanitarian concerns and that Vietnam and Cambodia no longer object to the dam's construction.

However, a recent meeting of scientists in the Thai capital has affirmed that dams, including hydropower plants, are the largest threat to the fisheries of the Mekong, which support the livelihoods of tens of millions of people. Dams also intensify the negative effects of climate change on the Mekong. Read more on that from <u>Voice of America</u>.

Compared with most of its neighbors, Laos is poor and still undeveloped. This also means it has relatively large areas of unspoiled nature. As is the case in other countries (like <u>Burma</u>) largely Chinese investment into infrastructure and business projects is changing the landscape of Laos, literally and economically.

# From <u>China Dialogue</u> (go to link for images):

In recent years, Chinese companies have poured billions of dollars into roads, dams and other infrastructure projects. The most notable is a US\$7 billion, 400-kilometre high speed railway line, announced last year, that will run from the southern Chinese city of Kunming to the Laos capital of Vientiane and on to ports in Thailand. It is one of several projects aimed at improving access of Chinese goods to markets in Laos and beyond.



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Speaking out against these projects can be dangerous, as environmental activists and NGO members have <u>recently discovered</u>.

"Laos: Development wins; human rights, environment lose", 03/04/2013, online at: <u>http://asiancorrespondent.com/104156/laos-development-wins-human-rights-environment-lose/</u>

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## Water use rife with externalities, use conflicts

In the past, conflicts over access to water largely were a feature of politics in "the arid west," often defined as that part of our country west of the 100th meridian. But increasing population density over the long run and a multi-year drought in the short-term have combined to move water politics to the east.

Even in my home state of Minnesota, the "Land of 10,000 lakes," water use policy is increasingly conflicted. So a review of some basic water economics is useful.

Start with a hydrologic phenomenon and an economic one. When I was in grade school in a tiny town in southwest Minnesota, we did not study economics or hydrology, but we understood inklings of both. "Flush twice, Edgerton has a water shortage!" we joked to each other in the bathroom.

We knew that our town's sewers dumped directly into a small creek and that our rival town a few miles downstream had an inadequate municipal well not far from the same creek. In dry summers, when creek flows were low, it had to impose water restrictions.

The hydrologic fact is that ground and surface waters often interact with each other, whether or not that particular well's aquifer was actually "hydraulically connected" to the creek, The economic one is that one person, business or municipality's use of water often affects its availability to others.

This is what economists call "externalities" — economic decisions that affect others who, in the absence of law or regulation to the contrary, have no say in the first person's decisions. And economics clearly shows that uncontrolled externalities cause inefficiency, so society gets fewer goods and services from a given set of resources.

Controlling externalities is the knottiest problem in all sorts of resource policy and one for which the increasingly popular libertarian point of view has no useful answers.

Start first, however, with the distinction between "stock" and "flow" resources. Stock resources, like iron ore or coal, are fixed in quantity, at least in human time as opposed to geological time. Flow resources, like sunlight or wind, are produced continuously and, in practical terms, won't run out even if widely used.

Water is both a stock and a flow resource. The hydrologic cycle of rainfall, infiltration or runoff, followed by evaporation and new rainfall, ensures that new fresh water is produced continuously. But there also is water in some aquifers, usually deep ones, for which recharge is so slow that for all intents and purposes, that water is as finite as hematite ore was on Lake Superior iron ranges.



To the east of the Rockies, there are some aquifers containing what geologists call "fossil water" that has been there for thousands of years. As it is pumped out for irrigation and municipal use, it is not replaced.

Decisions about how fast to use up such stock resources get into a society's "time preference." How much are we willing to give up today to have more in the future and vice versa? Flow resources don't present this complication.

Both categories often involve externalities however. Externalities occur when someone who can decide about the use of a resource reaps all the benefits of such use without bearing all the cost.

Economic theory is clear that in such cases, the resource will be used beyond the point of greatest economic efficiency. And one person will be harmed by the activities of another.

Some decades ago, whenever a certain Minnesota farmer pumped his irrigation well, it dried out the small sand-point wells of 21 nearby lakeshore cabins. Their lack of water was an external cost of his irrigation.

A lake about 10 miles from my house gets water from upstream in a very limited watershed and is hydraulically connected to aquifers.

Changed land use has reduced surface water inflows. Increased pumping from the connected aquifer has increased outflows. Someone benefits from the new use of land or from the water pumped, but other people who have lived on the lake for decades no longer have lakefront homes — they haven't moved, the lake has. That is an external cost.

In the farmer irrigation case, both the winner and the losers from the activity were clearly identifiable. For the lake, the losers are identifiable, but the winners are diffuse. And the situation can be much more ambiguous.

A creek runs through our farm, from my hometown on past its rival. Residues from the glyphosate herbicide and synthetic fertilizers applied to the cropland in the watershed leach into drainage tile that dumps into the creek. From there, they successively flow downstream into the Big Sioux, Missouri and Mississippi rivers and eventually contribute to the "dead spot" in the Gulf of Mexico.

Farmers across this watershed benefit from being able to use farm chemicals. And food is much cheaper for the general population than it would be if such chemicals were banned. But other people are harmed by their use.

Striking the right balance through regulation is hard. Libertarians, following the ideas of Nobel Laureate Ronald Coase, argue that we should not regulate.



Instead, simply have laws strictly defining property rights and then let involved parties settle disputes in court.

In the case of the irrigation well, if the law says irrigators must pay for damages, then the farmer would have to provide a new water source for the cabin owners.

If the law instead said, as it does in some states, that the cabin owners were responsible for constructing wells that "fully penetrate the aquifer," then they would have to bear the cost or collectively pay the farmer to not irrigate.

However, those hurt by falling levels in my local lake would have a hard time identifying whom to sue.

And for those people a thousand miles or more downstream who are hurt by agricultural runoff, the task of identifying those responsible is impossible.

There is much more in water economics, particularly the role of price in allocating scarce water. But this is a good start.

"Water use rife with externalities, use conflicts", 07/03/2013, online at: <u>http://bismarcktribune.com/news/columnists/ed-lotterman/water-use-rife-with-externalities-use-conflicts/article\_b0e65d7c-9c5e-11e2-8dbd-0019bb2963f4.html</u>

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### Waterpod' solution to desert nomads water woes

Desert nomads marvel at water purifying device at namodic festival in Morrocco which might solve their drinking water problems.

Omar Razzouki gazes intently at the wooden box, marvelling at what might be the solution to the perennial water woes that he and other nomads like him across the Sahara desert face daily.

More than 330 million people in sub-Saharan Africa, or around 40 percent of the population, do not have access to clean drinking water, according to a report published to mark world water day by British NGO WaterAid.

The World Health Organisation estimates that this lack of drinking water is the reason for nearly nine out of every 10 deaths linked to diarrhoea.

In the Sahara, nomads are among those suffering most from limited access to water, particularly during the hotter periods when rising salt levels in water drawn from wells make it undrinkable.

The "nomadic festival" held earlier this month in M'Hamid, in Morocco's southern desert region, was an opportunity for the pioneers of a portable water purification device to showcase their invention.

It uses a process as old as the sky.

"It's simple. It emulates the natural cycle of cloud condensation," explained Alain Thibault, an exsailor who had to confront the issue of fresh water shortages at sea.

The experience gave him the idea several years ago of reproducing the process using just a "small machine that is easy to make and easy to use."

The "waterpod" allows desert-dwellers to turn water extracted from wells into clean drinking water through evaporation and condensation, using the heat of the sun, a technology that the Arabs were among the first to develop as far back as the 16th century.

The device, which resembles a large letter box, currently costs around 500 euros (\$650).

But the inventors have already given courses at a college in Tiznit, on Morocco's Atlantic coast, to teach students how to produce them more cheaply.

"The waterpod is made of wood, cork, stainless steel and glass," said Thierry Mauboussin, who is helping to promote the water project in Morocco.



"It works with solar energy, so no fossil fuel."

Noureddine Bourgab, the president of the nomad festival at M'Hamid, also praised the environmental value of the new device, which he hoped could "put an end to the problem of salty water for the desert nomads."

"It's a technique that embodies the real meaning of sustainable development and protection of the environment," he said.

Razzouki, a nomad from the M'Hamid region, was concentrating hard on figuring out how the waterpod works.

"This could resolve many of our water problems," he said, noting that the box was light, and "we won't have the problem of salty water everywhere we go."

M'Hamid El Ghizlane, Morocco's gateway to the Sahara, is an oasis on the edge of the Draa valley surrounded by rolling sand dunes, 40 kilometres (25 miles) from the Algerian border.

The construction 40 years ago of a hydro-electric dam further up the valley to provide for the growing population and tourist trade at Ouarzazate, along with the relentless desertification of the region, has taken a heavy toll on water supplies.

So there are high hopes for the waterpod, one of which can produce six litres of pure water daily from 12 litres of brackish water, according to its creators.

They give it an estimated lifespan of 20 to 40 years, with just a daily clean needed to keep it in good condition.

"Waterpod' solution to desert nomads water woes", 02/04/2013, onlineat: <u>http://www.middle-east-online.com/english/?id=57857</u>

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#### WATER RESEARCH PROGRAMME -Weekly Bulletin-

### \* Top water issues focus for Dubai summit

Efficient water usage and technologies relating to wastewater in the oil and gas sector will form the agenda for the upcoming Global Water: Oil & Gas Summit in Dubai.

The second edition of the summit will be organised by the event provider CWC Group in partnership with the UAE Ministry of Environment & Water and the Dubai Supreme Council of Energy.

The two day Summit will take place on June 11 and 12 at the Madinat Jumeirah.

The summit will tackle two global issues critical to the Middle East region – energy production and water conservation.

Water plays a pivotal role in the production of oil and gas in the Middle East and the partnership between these industries is acknowledged as essential to meet the continually growing demand for oil and gas. As demand continues to increase, effective use of water - particularly in water-sparse areas such as the Middle East - is of the highest importance.

"We have created a platform for the water and oil and gas industries to be able to exchange information, ideas and collaboratively build sustainable solutions moving forward," said Gurpreet Hayre, Global Water event producer.

"We have assembled an agenda of topics that are very pertinent to the region's oil, gas and energy sectors, and focus on sustainable ways of maximising oil and gas production while seeking efficiencies in the use of water, which is one of the Middle East's most precious resources."

The Summit addresses key topics such as SMART water solutions, and water treatment technologies for enhanced oil recovery processes. It seeks to identify meaningful water usage efficiencies in maturing fields and heavy oil while presenting solutions for strategic water sourcing for oil and gas production.



"Our debut Summit in 2012 received very positive feedback, with attendees reporting substantial value gains. We are seeking to build upon this by creating a solutions-driven forum that can help assist with the global water challenge that is faced by the oil and gas industry," Hayre added.

The summit provides a platform for government officials and senior representatives from across the water and oil and gas industries to discuss best practices for boosting production through successful water strategies and how to maximise water usage whilst balancing environmental considerations.

"Top water issues focus for Dubai summit", 03/04/2013, online at: http://www.tradearabia.com/news/OGN\_233400.html

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### Saudi Water Signs Contract to Treat Industrial Wastewater

Saudi Arabia's National Water Co. agreed with Jeddah-based <u>Middle East Paper Co.</u> to a \$27 million deal to treat 5,000 cubic meters of industrial wastewater a day for 20 years, according to a <u>statement</u> citing the state-owned company's chief executive officer, Loay al-Musallam.

Saline Water Conversion Corp. Governor Abdulrahman Al- Ibrahim meanwhile visited the solar unit project due to start operating at the end of April that's to curb energy used in desalination plants, cutting the costs of producing water purified from the sea, the state Saudi Press Agency said.

Saudi Arabia, the biggest oil producer with the Arab world's largest economy, plans to build the biggest desalination plant in Rabigh on the kingdom's Red Sea coast. National Water Co. is planning to spend \$66 billion on water projects over the next 10 years.

"Saudi Water Signs Contract to Treat Industrial Wastewater", 02/04/2013, online at: <u>http://www.bloomberg.com/news/2013-04-02/saudi-water-signs-contract-to-treat-industrial-wastewater.html</u>

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### \* Amazon tribe threatens to declare war amid row over Brazilian dam project

Munduruku leaders hit out at 'betrayal' after government pushes on with dam construction without community's consent

An Amazonian community has threatened to "go to war" with the Brazilian government after what they say is a military incursion into their land by dam builders.

The Munduruku indigenous group in Para state say they have been betrayed by the authorities, who are pushing ahead with plans to build a cascade of <u>hydropower</u> plants on the Tapajós river without their permission.

Public prosecutors, human rights groups, environmental organisations and Christian missionaries have condemned what they call the government's strong-arm tactics.

According to witnesses in the area, helicopters, soldiers and armed police have been involved in Operation Tapajós, which aims to conduct an environmental impact assessment needed for the proposed construction of the 6,133MW São Luiz do Tapajós dam.

The facility, to be built by the Norte Energia consortium, is the biggest of two planned dams on the Tapajós, the fifth-largest river in the Amazon basin. The government's 10-year plan includes the construction of four larger hydroelectric plants on its tributary, the Jamanxim.

Under Brazilian law, major infrastructure projects require prior consultation with indigenous communities. <u>Federal prosecutors say this has not happened</u> and urge the courts to block the scheme which, they fear, could lead to bloodshed.

"The Munduruku have already stated on several occasions that they do not support studies for hydroelectric plants on their land unless there is full prior consultation," the prosecutors noted in a statement.

However, a court ruling last week gave the go-ahead for the survey. Government officials say that neither researchers nor logistical and support teams will enter indigenous villages. The closest they will get is about 30 miles from the nearest village, Sawré Maybu.

The ministry of mines and <u>energy</u> noted on its website that 80 researchers, including biologists and foresters, would undertake a study of flora and fauna. The army escort was made possible by



President<u>Dilma Rousseff</u>, who decreed this year that military personnel could be used for survey operations. Officials say the security is for the safety of the scientists and the local population. Missionaries said the presence of armed troops near Sawré Maybu village, Itaituba, was intimidating, degrading and an unacceptable violation of the rights of the residents.

"In this operation, the federal government has been threatening the lives of the people," the <u>Indigenous Missionary Council</u> said. "It is unacceptable and illegitimate for the government to impose dialogue at the tip of a bayonet."

The group added that Munduruku leaders ended a phone call with representatives of the president with a declaration of war. They have also issued open letters calling for an end to the military operation. "We are not bandits. We feel betrayed, humiliated and disrespected by all this," a letter states.

One of the community's leaders, Valdenir Munduruku, has warned that<u>locals will take action</u> if the government does not withdraw its taskforce by 10 April, when the two sides are set to talk. He has called for support from other indigenous groups, such as the Xingu, facing similar threats from hydroelectric dams.

Environmental groups have expressed concern. The 1,200-mile waterway is home to more than 300 fish species and provides sustenance to some of the most biodiverse forest habitats on Earth. Ten indigenous groups inhabit the basin, along with several tribes in voluntary isolation.

With similar conflicts over other proposed dams in the Amazon, such as those at Belo Monte, Teles Pires, Santo Antônio and Jirau, some compare the use of force to the last great expansion of <u>hydropower</u>during the military dictatorship.

"The Brazilian government is making political decisions about the dams before the environmental impact assessment is done," said Brent Millikan of the International <u>Rivers</u> environmental group. "The recent military operations illustrate that the federal government is willing to disregard existing legal instruments intended to foster dialogue between government and civil society."

"Amazon tribe threatens to declare war amid row over Brazilian dam project", 03/04/2013, online at: http://www.guardian.co.uk/environment/2013/apr/03/brazil-dam-activists-war-military

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### Solution: Fish Ladders On U.S. Dams Are Not Effective

Fishways on rivers in the U.S. Northeast are failing, with less than 3 percent of one key species making it upriver to their spawning grounds, according to a new study. The researchers' findings provide a cautionary tale for other nations now planning big dam projects.

In most major rivers in the U.S., maintaining some semblance of the integrity of migratory fish runs past hydropower dams is dependent upon the fish using ladders and elevators as freely as do two-legged humans. But is this asking too much?

Six colleagues and I undertook <u>a study</u> of the success — or, rather, failure — of Atlantic salmon, American shad, river herring, and other species in migrating from the sea to their spawning grounds past a gauntlet of dams on three rivers in the northeastern U.S. — the Susquehanna, Connecticut, and Merrimack. What we found was grimmer than we expected. For one species, American shad, less than 3 percent of the fish made it past all the dams in these rivers to their historical spawning reaches.

Results for other anadromous species (those that spawn in fresh water and migrate to the ocean and back again) were nearly as bad. And the sobering aspect of these contemporary studies is that they are based on the insubstantial number of fish today as compared to earlier massive migrations of these species, which numbered in the many millions. While investigating fish passage on the Merrimack River in New Hampshire, our project's lead researcher, Jed Brown of the U.S. Fish & Wildlife Service, was struck by the long-term lack of recovery of the targeted fish populations — at some fish restoration meetings there were more people in the room than salmon in the river.

What has happened on the U.S. East Coast, as reported in our study published <u>in the</u> <u>journal Conservation Letters</u> in January, is of more than regional or national interest. There are important global conservation lessons, as well. Even as some large dams in the U.S. begin to be removed for environmental reasons, a hydropower boom is occuring worldwide. Thirty large dams have been announced for the Amazon River alone. Eleven major dams are planned for the lower Mekong River. The dam industry in Canada wants to dramatically expand its recent hydropower


initiative.

And dam projects are proposed, planned, or in the works for Africa's upper Nile, the Patuca in Honduras, the Teesta in India, the upper Yangtze in China, the Tigris in Turkey, the Selenge in Mongolia, and many others. Though most of these rivers lack anadromous fishes, many are home to richly diverse freshwater fish communities that make important seasonal migrations within these river systems.

For the international community, the record of fish passage on rivers in the northeastern U.S. is a cautionary tale. Hydropower has often been billed as a clean source of renewable energy, and generating electricity without polluting the air or producing greenhouse gases is commendable. But "clean" is in the eye of the beholder, and any claims to being sustainable ignore its multifarious aquatic effects, including blocking fish passage, fragmenting habitat, and undermining a river's fundamental ecological services.

What's clear is that providing fish passage facilities at a dam is not a panacea. Fishways are to be included in some of these large international projects, but not in others. Yet the options are dismal: To not include fish passage on a large dam is to ensure disruption of critical fish migrations; but to include fish passage is to likely diminish and maybe even endanger critical fish migrations.

Brown's research began when, as a biologist for the U.S. Fish & Wildlife Service, he relocated in 2005 from the free-flowing mainstem-Delaware River to the thoroughly dammed Merrimack. Brown was struck by the small number of fish making it past the dams. Most fish passage research seeks to engineer improvements to existing technologies; Brown insteaddecided to launch a survey of the actual long-term results of fish passages on large, heavily dammed rivers.

What Brown and I and our coauthors found was bleak. One metric used was the percentage of fish passing the first dam that also passed just the second dam. For shad, the numbers were 16 percent on the Merrimack, 4 percent on the Connecticut, and 32 percent on the Susquehanna. But on these rivers the second dam is only the beginning of the journey — these rivers and many others have multiple dams blocking access to historical spawning reaches.

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It's important to put these results in perspective because they are merely*relative* to the present paltry numbers of fish that even attempt to migrate up these rivers. For an anadromous fish population in North America, there are three *absolute* numbers that matter. One is how many ran annually before European colonization. The second is the numbers targeted for restoration in fish passage programs. And the third are the numbers that actually show up each year.

On all three rivers examined, restoration goals were in the hundreds of thousands of fish — at least one, if not two, orders of magnitude less than historic, pristine runs. Yet run sizes obtained across three decades ranged annually from a high of about 10 percent to, more commonly, 2 percent or less of the stated goals. To put it in historical context, despite vast spending on modern technologies, contemporary shad migrations on these rivers are at least three to four orders of magnitude below the original unfettered run sizes, with similar results for salmon and river herring. Dams alone don't explain these results — overfishing, habitat destruction, and alien species contribute — but there is widespread consensus among fish biologists that dams are a primary cause.

No East Coast river has been as adulterated as the Susquehanna, once a veritable shad factory. Shad ran up the Chesapeake Bay, entered the river's mouth, and swam throughout its tributaries and mainstem through much of Pennsylvania and almost 500 miles to Cooperstown in central New York. Shad schools driving upriver on the Susquehanna were so enormous that they were visible in the distance to commercial fishermen by the waves they pushed ahead of them. One notable haul of mixed shad and river herring made in 1827 was estimated at 15 million fish; it took more than three days to offload the catch into wagons.

Contrast the open river of yesteryear with the occluded present. A shad fresh from the Atlantic entering the Susquehanna according to its natural rhythms encounters the almost 100-foot-tall Conowingo Dam only 10 miles from the river mouth. There it must somehow sense a tongue of water — the "attraction flow" — at the dam's base in order to allow itself to be lifted in a metal trough to the reservoir above. Next it must orient in the strangely still water and then move upriver past three more dams using fish ladders — lengthy angled chutes with baffles that break up the flow.



With these serial delays it is unlikely that the few shad that make it to the spawning reaches of the Susquehanna arrive at the optimal time in the river's seasonal ecological cycle. Worse yet, the numbers of adults successfully returning downstream past the dams to the sea are nil, sacrificing their future spawning potential. And with very low or high waters, fishways either don't work well or shut down altogether, further delaying migrations.

Electric utility companies have nearly de facto sovereignty over migratory fish on these rivers, with the installation of fishways providing legal but largely ineffectual mitigation for their operations. Exploring technological

improvements is limited by costs and the inflexibility of the utilities. That industry is in control may be atoned for with feel-good shad fishing derbies or informational facilities. The Amoskeag Fishways Learning and Visitors Center on the Merrimack in New Hampshire, for example, features a giant sculpture of a leaping American shad. Sadly, though, during most recent years that is the *only* anadromous fish you will see at the center, for rarely does even a single living salmon, shad, river herring, or sea lamprey make it as far as the Amoskeag Dam.

In the U.S., the overall record of fish passage is mixed. Fish ladders often work well for river herring on smaller Atlantic rivers. Fish ladders at dams on the West Coast's giant Columbia River system allow large numbers of salmon and also non-native shad to pass, but despite this apparent success contemporary runs of salmon are likely an order of magnitude lower than historic abundances. Chum salmon runs once numbered well more than a million; today they are about three percent of that.

Is it the nature of fishway technology itself or is it less than optimal implementation that is at fault? John Hay, author of *The Run*(1959), was a keen observer of river herring on Cape Cod, where fish ladders work relatively well. He wrote nonetheless, "There is no such thing, I have been told by men who were in the business of making them, as a good or even adequate fishway. There is always an imbalance between the purposes they serve and the results."

My friends in the fish passage world disagree and say the fault is the difficulty in being able to fine-



## WATER RESEARCH PROGRAMME -Weekly Bulletin-

tune and test new ideas at real-world fishways. Fish passage researchers are earnest, hard workers who need to be optimistic; they tend to believe they are just a tweak or an insight away from a breakthrough. Perhaps they are. Clearly, with the existence of hydropower dams a continuing reality, any enhancements they can wring from fishways will be welcome.

One simple and promising idea being tested in Europe is to line the bottom of fish ladders with rubble to make the ladders seen less artificial. And in some suitable locations in the U.S. and elsewhere, "naturalized" fishways are being built that more closely resemble actual river reaches. In Germany, researchers are building fishways of different designs and then testing them, before applying the new knowledge to the next set of fishways. It's not clear how well these new approaches will work, but it's imperative to find out.

In the end, the challenges are daunting, and for a simple reason: It's asking a lot for a finned creature to take an elevator or to climb a ladder.

"Blocked Migration: Fish Ladders On U.S. Dams Are Not Effective", 04/03/2013, online at: http://e360.yale.edu/feature/blocked\_migration\_fish\_ladders\_on\_us\_dams\_are\_not\_effective/2636/?utm\_source=feedbur ner&utm\_medium=feed&utm\_campaign=Feed%3A+YaleEnvironment360+%28Yale+Environment+360%29&utm\_sour ce=Circle+of+Blue+WaterNews+%26+Alerts&utm\_campaign=9d93252eb6-RSS\_EMAIL\_CAMPAIGN&utm\_medium=email

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