

ORSAM WATER BULLETIN

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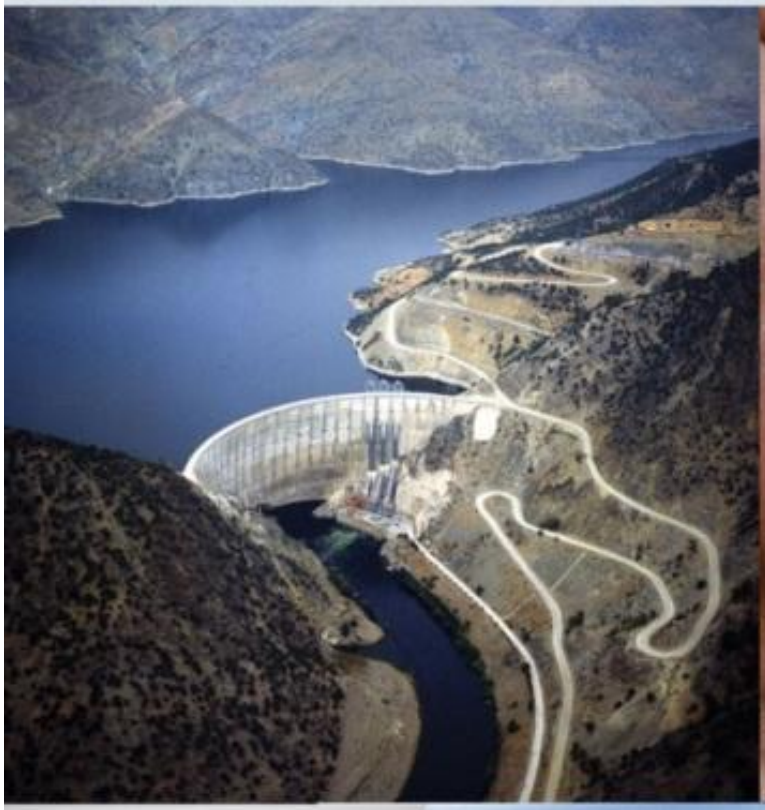



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- **Joel Brinkley: Dam construction raising regional tensions**
- **More than water play**
- **Arison's Miya to expand water projects globally**

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❖ The Tigris and Euphrates; Less fertile crescent

THE Middle East is arid. But it is also home to some of the world's most fertile rivers, such as the Nile. So it is all the more alarming that one of its great river basins, the Tigris-Euphrates—which flows through the so-called fertile crescent that gave birth to agriculture itself—is getting drier. According to a study in *Water Resources Research*, an American scientific journal, between 2003 and 2009 the region that stretches from eastern Turkey to western Iran lost 144 cubic kilometres of fresh water.

That figure is vast. It is equivalent in volume to the Dead Sea and, according to the study's senior author, Jay Famiglietti of the University of California, Irvine, implies that the region is suffering the world's second-fastest rate of water depletion after northern India. The water table sank by 0.3 metres (one foot) a year in 2006-09. At the point where the Euphrates crosses from Syria into Iraq, it now flows at only 70% of the rate it once did. All this in an area that already faces severe water shortages.

The study provides the first accurate estimate of all the water in the basin. National statistics are flawed and incomplete; some figures are even state secrets. But the study uses satellite data from America's NASA which is not subject to these restrictions. These satellites not only measure surface water by photographs but, thanks to precise measurements of the effect of bodies of water on the atmosphere, can even calculate the amount of water in the aquifer below them.

The main reason for the depletion turns out to be that more water is being taken out of the underground aquifer, mainly by farmers. The rate of loss accelerated after drought hit the region in 2007. Between 2007 and 2009, in response to reduced flows of water in the rivers, Iraq's government dug 1,000 new wells and abstracted four-fifths of all its groundwater reserves. The aquifer is not being replenished at anything like that rate, so this cannot continue for long.

The rapid depletion has implications for managing the basin, which is shared by Turkey, Syria, Iraq and Iran. All the countries have extensive dams, reservoirs and other sorts of infrastructure on both rivers which control the water's flow. But they have no international treaty governing when and by how much they can shut the flow down.

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Over the years, this has not mattered much. The countries have rubbed along, sometimes amicably, sometimes not, with downstream ones (notably Syria and Iraq) assuming there would always be enough water in the upstream reservoirs of Turkey for them all. But if the new study is any guide, that assumption may not hold for much longer. As Mr Famiglietti says, "The region is ripe for collaborating on the science of water management. Whether it is ready for an international legal framework, I have no idea."

"The Tigris and Euphrates ;Less fertile crescent", 09/03/2013, online at: http://www.economist.com/news/middle-east-and-africa/21573158-waters-babylon-are-running-dry-less-fertile-crescent

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❖ Feeding the Middle East; By the receding waters of Babylon

This week's *Economist* contains an alarming account of the big decline in the waters in and below the Tigris and Euphrates rivers. These flow from eastern Turkey to the Gulf and form part of the so-called "fertile crescent", the birthplace of agriculture. See here. The data, collected by NASA satellites and available here, suggests that the Tigris-Euphrates is experiencing the second fastest rate of water depletion in the world, after northern India.
That is obviously disturbing in its own right and, as the article points out, will put considerable pressure on the existing (minimal) system of water management in the basin. But it is also a sign of another, potentially more explosive problem: the increasing difficulty of feeding the Middle East.

Middle Easterners eat more wheat than anyone else in the world. Egyptians and Syrians eat over 150 kilogrammes a year; Tunisians over 200kg. That compares with 100kg in Britain and France and 90kg in America.

Some of this wheat is grown in the region – mainly along rivers like the Tigris, Euphrates and Nile. The Middle East is arid; its farmers depend almost entirely on the fertile rivers and underground aquifers. If these sources run dry, that will have significant implications for the rest of the world.

Over the past 45 years, the Middle East's huge demand for wheat has been met increasingly by imports. In 1965, the Middle east and Africa were importing only small amounts of food. By 2010, according to Cargill, a big firm of grain traders, they were importing over 150m tonnes, the largest amount in the world. See here.
If the water table of the fertile crescent sinks further and there is less water in the life-giving rivers, Arab demand for wheat from food exporters in the rest of the world will grow considerably – and that demand is hard enough to meet even now.

"Feeding the Middle East ;By the receding waters of Babylon", 08/03/2013, online at:
http://www.economist.com/blogs/feastandfamine/2013/03/feeding-middle-east

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❖ Water challenges increasing for countries in Middle East

The world's driest region, the Middle East and North Africa (Mena), is getting drier at an alarming rate.

And yet, despite massive population growth (the Middle East's population grew 61% from 1990 to 2010 to 205mn people)* predictions of so-called "water wars" have failed to materialise.

So how has a region that water experts say ceased to have enough water for its strategic needs in 1970 proved so resilient to water scarcity?

"Trade is the first means of being resilient; it's the process that enables an economy to be resilient. The ability to trade effectively depends on the strength and diversity of the economy," Anthony Allan from King's College London and the School of Oriental and African Studies told IRIN.

That does not literally mean that countries import water directly; it is rather that because so much water is used, not for drinking, but for agriculture (around 90%), by importing food staples like wheat you are in effect importing water, something Allan calls "virtual water".

As a result, the region's growing population imports around a third of its food - a figure that shoots up in the Gulf states where arable land is negligible.

But while such resilience may "miraculously" solve extreme water scarcity and make life that exists today possible in the Middle East, it can create its own vulnerabilities; countries need economies that can generate enough foreign currency to pay for imports.

That may be easy in oil-rich countries with small populations like the United Arab Emirates and Qatar, but it is far more difficult in places like Egypt, which struggles to find the reserves to pay for wheat imports for its 84mn citizens in a context of declining crude oil exports and a slump in tourism.

Such trade "resilience" is also largely unaffordable in a place like Yemen - the region's poorest country, which has 25mn people in an extremely water scarce (and hence food scarce) environment.

Each Yemeni only has access to about 140 cubic metres of water annually and the capital, Sanaa, is on track to be the first in the world without a viable water supply.

While trade, an abundance of historically cheap food on international markets, and for some oil - sold at high prices - have combined to create an unexpected resilience in the face of water scarcity, such lessons may not travel well in the developing world.

Trade may have reduced dependency on local water supplies, but it has shifted dependency to international markets and exposed people to fluctuating world prices.

It has also hidden the gravity of the water scarcity situation in the Middle East and made it easier to neglect the development of other solutions to a problem that shows no sign of going away.

A recent study of Nasa satellite data published found that parts of Turkey, Syria, Iraq and Iran along the Tigris and Euphrates river basins had lost 144 cubic kilometres of water from 2003 to 2009 - roughly equivalent to the volume of the Dead Sea.

An analysis of the data published in the *Water Resources Research* journal attributes about 60% of the loss to the pumping of groundwater from underground reservoirs - reserves people fall back on when rivers dry up.

Underground reserves can only last so long, and importing ever increasing amounts of food to feed a growing population is not an option for poorer countries.

Nevertheless, there are other lessons in water scarcity resilience from the Middle East - either measures that have been shown to build resilience, or that water experts have come to understand would improve the strength of the system to further shocks if they were broadly implemented.

Some of these solutions are not new.

For a start, though the region may be drying, it has been dry for a long time.

“Water scarcity is not new to the region,” Hamed Assaf, a water resource management specialist at the American University of Sharjah in the UAE, told IRIN.

“It has been the norm for thousands of years and people have adapted their survival strategies to changes in rainfall and temperature,” he told IRIN.

With scientist predicting an increase in extreme weather events, adaptability has become increasingly important. It is also true that there remains a degree of unpredictability in the system, particularly in Egypt where it is not clear if future rainfall will increase or decrease.

Resilience is about being strong in the face of whatever happens. And in any situation, strong water systems make the most of what they have - including through treating and reusing waste water like at the Al Gabal Asfar water treatment plant in Egypt.

One old technique is rainwater harvesting. “In Jordan there are indications of early water harvesting structures believed to have been constructed over 9,000 years ago,” Rida al-Adamat, director of the Water, Environment and Arid Regions Research Centre at Jordan’s al-Bayt University, told IRIN.

Jordan harvests 400-420mn cubic metres of water annually, according to Ministry of Water and Irrigation spokesperson Omar Salameh.

“We have 10 major dams with a total capacity of 325mn cubic metres, in addition to hundreds of sand dams in different locations to develop local communities and recharge groundwater.”

Water harvesting can be done at the household level especially in areas that get enough rainfall during the rainy season. “If your area gets 500mm of rain per year, you can collect enough water for household use,” said Assaf.

"In Lebanon, people used to build ponds to collect water during winter and use it later on for irrigation and breeding animals," said Assaf.

"The main idea of water harvesting is to increase green water or soil moisture… Farmers in the region used to build small sand barriers on slopes to prevent the water from going down and thus recharge the area. Then they used to plant in the areas behind the barriers," he added.

A key aspect of efficient water use is data collection - important for sound water management at the country level.

"As the saying goes: what you cannot measure you cannot manage," Heba Yaken, water and sanitation operation analyst at the World Bank office in Cairo, told IRIN. "It is important to know how much you are consuming in order to manage it in a good way."

Jordan, which some say has one of the most monitored water scarcity situations in the world, has gained widespread recognition for its data collection.

"Jordan's data is relatively well organised, especially when it comes to agriculture. The volume of water consumption is precisely known in every area. They have installed measuring tools in every area so they know what kinds of crops are being cultivated and the amount of water they consume," Hiba Hariri from the Arab Water Council told IRIN.

Data-sharing in the region is limited, according to Yaken. "Countries are not as transparent as they should be," she said.

A whole range of solutions are being piloted and recommended in the Middle East.

In Egypt, the Arab Spring has encouraged farmers to become more outspoken in demanding their water rights, says Yaken from the World Bank.

Farmers have come together in "water users' associations" to help manage supplies and become more aware of water scarcity issues.

"Farmers are now responsible for the 'mesqas' (canals)", Yaken told IRIN.

"People at the tail of the `mesqa' don't get as much water as the people upstream. People are receiving much more training so that they can manage those disputes between the different farmers, and different demands," she said.

Elsewhere, capacity building is being carried out by the German Agency for International Co-operation (GIZ), which is running a climate change adaptation scheme designed to help Arab states climate-proof water systems.

While trade provides substitutes for much agricultural water use, the remaining 10% of water needs are increasingly being met by desalination, half of which globally is carried out in the Middle East.

Recent years have seen a large increase in desalination, clearly useful in a region without any landlocked countries, but it is an energy-intensive phenomenon almost entirely powered by fossil fuel power, which raises other environmental concerns.

Saudi Arabia uses 1.5mn barrels of oil a day to power its desalination plants, although it is looking to develop solar-powered plants.

Solar is a largely unexplored option for desalination, but also for increasing the efficiency of water systems, through technologies like solar-powered water pumps.

But although desalination may become an increasingly affordable, and renewable, solution, water experts say it can only be used as part of wider reforms.

A more resilient water system will also need adaptions on the demand side, including more efficient consumption of water, as well as co-operation between countries on the sustainable use of current resources.

"The problem is that we have short-term plans that change with the change of personnel or ministers," said Hariri from the Arab Water Council.

As climate change and population growth increase pressure on water systems, the Mena region will need to be increasingly efficient in its use of water - and may have lessons for other parts of the world.

"Water challenges increasing for countries in Middle East", 10/03/2013, online at: http://www.gulf-times.com/opinion/189/details/345046/water-challenges-increasing-for-countries-in-middle-east

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❖ Desalinating Holy Waters with the Red Sea-Dead Sea Conveyance

Posted from Tel Aviv by Sasha Richey, UCCHM Graduate Fellow. This is the third in a series of posts on our Water Diplomacy trip to Israel, Jordan and Palestine. Other posts in the series: 1) Middle East Lost a Dead Sea Amount of Water in 7 Years, by Jay Famiglietti ; and 2) Parallel Worlds: Water Management in Israel and California, by UCCHM Policy Fellow Kate Voss.

The Dead Sea sits in the heart of the world's three main religions. According to the Torah, the Dead Sea was created by God in Sodom and its neighboring cities. It was where the Prophet Lot was sent for pilgrimage according to the Quran. The Dead Sea is fed by the waters that are said to have baptized Jesus Christ, the "mighty" Jordan River.

Despite the cultural, hydrological, historical, and socio-economic value of this unique water body, unsustainable use of the Jordan River and mining of its minerals continues to threaten the existence of the Dead Sea as it loses water at a rate of about one meter per year. However, the very project that is proposed to restore the sea has the potential to destroy it as well. TheUCCHM water diplomacy team attended the February 19, 2013 Multi-Stakeholder Consultation in Jerusalem on the proposed Red Sea-Dead Sea Water Conveyance program with the hope of learning more about the future of the project from stakeholders in Jordan, Israel, and the Palestinian Authority.

Overview of the Red Sea-Dead Sea Conveyance

There are three main objectives for the Red Sea-Dead Sea conveyance project: 1) to save the Dead Sea from environmental degradation; 2) to desalinate Red Sea water as a drinking water source for Amman, Jordan; and 3) to build a symbol of peace and cooperation between the three stakeholder entities. The "identified option" to meet these three goals is the "Red-Dead conduit," which proposes to build a $10.6 billion dollar conveyance system to transfer saline water over 200 kilometers from the Red Sea north to the Dead Sea. The water would first be pumped up 250 meters from the Red Sea, and then would provide hydroelectricity as it travels down to the Dead Sea (elevation 423 meters below mean sea level). A desalination plant would be built by the Dead Sea to send freshwater up to Amman (elevation about 800 meters above mean sea level). The brine waste from desalination and extra seawater would be disposed of in the Dead Sea in order to restore and stabilize its water level.

The project was initially proposed by the Jordanian government, which then joined with Israel to present the concept to the World Bank. At that point, the World Bank required that the Palestinian Authority be added as a main stakeholder based on their riparian rights to the Dead Sea, which created a trilateral, cooperative project. Since then, the World Bank has acted in a management role to coordinate the project study efforts and to gain international support should the member countries choose to go forward with the project. The aim of the February 19, 2013 stakeholder meeting that we attended in Jerusalem was to present the key findings of the five initial studies conducted for the project, including a Feasibility Study and an Environmental and Social Assessment (ESA) Study, and to gain insight about the concerns and criticisms of leading civil society stakeholders in each country. Parallel consultations were held in Jordan and the Palestinian territories.

Based on the feedback from the public hearing and the five initial studies, it is not clear that adequate work has been done to fully understand the impacts of the "identified option." The Feasibility Study reports that a minimum of 700 million cubic meters of additional water per year are necessary to stabilize the Dead Sea's current water level, while more water will be needed to replenish it to historical levels. At about 400 million cubic meters per year of additional water, the amount of groundwater depletion in the surrounding area will stabilize.

The project managers proposed a pilot project to further explore the project's feasibility and environmental impacts, but the pilot would only add up to 400 million cubic meters per year. It is exactly at this point that uncertainty is introduced in the ESA, whereby the environmental impacts of adding more than 400 million cubic meters of Red Sea water and brine to the Dead Sea are unknown.

According to Alex McPhail, the World Bank team leader on the project, there are only two other alternatives to the Red-Dead conduit that meet the three project objectives. The first is building a conveyance system from the Mediterranean to the Dead Sea for desalination. The second is a combination of desalination in the Gulf of Aqaba, water transfers from the Mediterranean, recycling and conservation, and water transfers from Turkey.
As our group's recent paper on groundwater depletion trends from GRACE in the Tigris-Euphrates and Western Iran region shows, Turkey is losing large amounts of groundwater and surface water, and is therefore not a reliable water supply source. Prof. Jay Famiglietti made these comments during the open discussion period of the stakeholder meeting in Jerusalem (video to be uploaded shortly).

Stakeholder Perspectives and Water Management Challenges

The Red-Dead conduit epitomizes the global challenge of balancing water supply and demand between environmental, domestic, agricultural, and industrial needs. Our first impressions of the Red-Dead conduit have remained with us throughout our discussions with different stakeholders; it is an incredibly expensive project with dangerously little known about the environmental impact to the Dead Sea ecosystem.

It is not clear that this large infrastructure project would accurately represent the type of "peace project" that is described as a main project goal; nor will it provide environmental restoration to the Dead Sea beyond stabilizing its water level. However, our initial impressions have been challenged by the realities faced on the ground in relation to managing water scarcity, particularly in Jordan.

While in Amman, we met with the Secretary General Assistant of Technical Affairs in the Ministry of Water and Irrigation, Ali Subah. According to the Secretary General Assistant, the Jordanian government opposed the idea of a Red-Dead conduit 10 years ago, but has since been forced to change its position due to increasing water scarcity. Shuba told us, "Never put your soil in other hands with relation to water," and that "without the Red-Dead project there is no way to keep water security in Jordan."

He described an example of Jordan's water challenges, with a reservoir that was constructed to capture water from the Yarmouk River. The reservoir was constructed with a capacity of about 110 million cubic meters, just half of the capacity recommended by scientists, anticipating the challenges that they would have with filling it. The reality was worse than planned, with a maximum volume of just 15 million cubic meters accumulated between 2007 to 2012. Upstream water use and climactic factors had severely reduced Jordan's water supply to a small fraction of their legal allocation. The combination of population growth, an influx of Syrian refugees, and a limited economy based on mining, mineral extraction, and tourism are putting a huge strain on Jordan's minimal natural resources. Jordan is looking for a big fix, and it now sees the Red-Dead conduit as its great hope for a sustainable water future.

In contrast, Friends of the Earth Middle East (FoEME), a non-profit organization that brings Israeli, Jordanian, and Palestinian environmentalists to work together, says the fix should come from restoring the Dead Sea's source waters, the Jordan River. Munqeth Mehyar, the Jordanian Director of

FoEME said the Red-Dead conduit, "would kill us," from both an environmental perspective and the necessary reliance on foreign aid to fund the project.

At UCCHM, we agree that promoting conservation, efficiency, repairing of existing infrastructure, monitoring groundwater extraction and improved water pricing are among the best ways to begin restoring the Jordan River and the Dead Sea. Part of the goal of our trip here is to see how ourGRACE results and detailed water modeling can contribute to regional water management decisions, such as exploring the full environmental implications of mega-projects like the Red-Dead conduit, as well as comprehensive evaluation of its alternatives. However, there continues to be challenges to combine the best available science with political willpower for efficient water management decisions.

An Uncertain Future

The Red-Dead conduit project represents daunting challenges for water management in the Israel-Jordan-Palestinian Authority region. Although the specifics of the project are unique to this area, the broader challenge of balancing environmental preservation with a reliable water supply for human use is universal. For example, California already transfers large volumes of water over hundreds of kilometers in an effort to achieve this balance.

It is clear that there is no single solution, including the Red-Dead conduit, that will meet all water demands in a region. Lessons must be taken from places like New York City and its restoration of the Catskills Mountains, as a model to restore the Jordan River. Orange County's ownGroundwater Replenishment System, which treats and reuses wastewater, is an example of a large infrastructure project that has the potential to be hugely successful in water-scarce regions. But, ecosystem restoration and infrastructure must be coupled with "small" fixes, such as repairing leaky pipes, implementing conservation and efficiency, and increasing transparency and communication between all end-users of shared water resources. This is a grand challenge in a region with the political and physical complexity of the Dead Sea basin, but a necessary one.

The future of the Red-Dead conduit remains uncertain. Political willpower, the need for environmental preservation, and a substantial amount of fundraising will dictate how priorities and resources are allocated. Moving forward, the project's goals must be clear, whether the priority is to try to restore the Dead Sea first or to provide freshwater in Amman. As the project currently stands, these goals cannot be met in tandem. We hope that our work at UCCHM can provide a regional

perspective for water transfers and management decisions, but ultimately the decision will come down to the key governmental and civil society stakeholders.

The striking similarities between, California and the United States and the Red-Dead conduitprovide a case study of the challenges for water management and large-scale water conveyance systems. The U. S. and other highly developed countries have made numerous environmental mistakes en route to developing the infrastructure required to maintain reliable water supplies to growing populations. Hopefully the Israel-Jordan-Palestinian Authority region can learn from these mistakes, and provide the world with a new model for combining ecosystem restoration with cooperative water management.

"Desalinating Holy Waters with the Red Sea-Dead Sea Conveyance", 04/03/2013, online at: http://newswatch.nationalgeographic.com/2013/03/04/desalinating-holy-waters-with-the-red-sea-dead-sea-conveyance/

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❖ $10 Billion Red Sea-Dead Sea Middle East Water Project Roiling, Again, Israel, Palestinians, And Jordan

JERUSALEM -- It took a miracle for Moses to part the Red Sea's water.

Now, a mammoth multinational project to do pretty much the same thing may need a comparable level of divine intervention.

The proposed $10 billion Red Sea-Dead Sea conduit -- a joint Israeli, Jordanian and Palestinian project touted by its supporters as the solution to Jordan's water deficit and the Dead Sea's environmental degradation, as well as the catalyst for regional peace -- is facing hurdles as immense as its lofty goals.

"It's way too complicated," said Munqeth Mehyar, director of the Jordanian arm of Friends of Earth Middle East or FoEME, a trinational Israeli, Jordanian and Palestinian organization dedicated to making peace through environmental projects.

Proponents say the conduit would stabilize the depleting Dead Sea by piping each year 2 billion cubic meters of seawater from the Gulf of Aqaba into the inland body of water. Along the way, the water would be pumped through hydropower plants to generate electricity and desalination plants to produce drinking water. The by-product would be up to 800 million cubic meters of fresh water when the desalination plants run at maximum capacity. The lion's share of fresh water would go to water-poor Jordan, and the leftover brine to the Dead Sea, which is receding at a rate of 1 meter, or more than 3 feet, a year.

It sounds like a dream come true. But the science is far from certain and the financing is shaky -- and then, there's the politics.

The last two weeks have seen stormy discourse at public hearings in Jerusalem, Ramallah and Amman between the project's staunch proponents and those not quite so convinced that the World Bank's $16 million feasibility study and an environmental and social assessment of the project, released in January, hold water.

Critics say the project would require international donations totalling $4.5 billion, while the world still grapples with the aftermath of a global economic crisis. Three billion dollars more would come mostly from private business investment in Israel. Cash-strapped and heavily indebted Jordan would have to secure an extra $2.5 billion. Israel would have to recognize the riparian rights of Palestinians to the West Bank portion of the Dead Sea. None of these things are easy.

But the biggest concerns stem from the possible environmental impacts. Israel's Ministry of the Environment released a statement in early February in light of the reports and of a $500,000 alternatives study, also conducted by the World Bank.

"The Dead Sea is a unique and a rare natural resource, and hasty decision -- devoid of real data and tests -- may destroy it completely and with it the tourism," said Israeli Environmental Protection Minister Gilad Ardan.

It's hardly a "hasty decision," though. Talk of a canal or conduit between the Red Sea and Dead Sea has been around for decades, and the World Bank has worked on the project since 2005. Now that the international body's reports are out and the public hearings are complete, it's decision time for the governments of Israel and Jordan and the Palestinian Authority.

Israel's Ministry of Regional Development, headed by Vice Prime Minister Silvan Shalom, leads the conduit project in Israel. Maya Eldar, who advises Shalom on the project, said the ministry remained in favor of the conduit. "We are going to … check whether it's going to work economically and environmentally. But it should be something that's going from the Red Sea to the Dead Sea. To leave the Dead Sea like this is to let it die. This is trying to prevent it," she said.

The Jordanian government supports the conduit, so long as money promised by some Gulf states actually appears, as does the Palestinian Authority, at least in principle.

Three Goals

The project's three objectives are to save the Dead Sea from environmental degradation; to generate electricity and desalinate water at affordable prices for Israel, Jordan, and the Palestinian Authority; and to build a symbol of peace and cooperation in the Middle East.

The degradation of the Dead Sea -- which is actually a hypersaline lake -- is due to the stemmed flow of the Jordan River and to the extraction of valuable minerals and potash from the water, by companies that evaporate between 280 and 350 million cubic meters of it each year.

Environmentalists say that trying to replace it with water pumped in from an actual sea 200 km (130 miles) away is a jump into the unknown. And in any case, it may not be enough: the Dead Sea needs 1 billion cubic meters of new water each year to reach a stable state, according to the Word Bank's feasibility study.

What is known is that adding Red Sea water to Dead Sea water will change the chemical composition of the latter, particularly the first 50 meters (about 160 feet) of depth. What remains a mystery -- in the absence of a pilot study or full 3-D modeling -- is how much, and whether it would alter the Dead Sea permanently.

The surface layer will certainly dilute and may reach the critical value where the biological phenomena of red algae blooms occur. According to the reports, the algae blooms would result "in changes of water color, turbidity and possibly floating slimy deposits in the waters."

Mixing the two waters will also produce gypsum, a mineral that could have the beneficial effect of curbing the algae. Or, it could turn the Dead Sea white.

FoEME has opposed the project since it was first proposed in its current form at the Earth Summit 2002 in Johannesburg.

The chief complaint from the group has to do with the Dead Sea's attraction as a natural spa, due to its unique mineral composition, said FoEME's Israeli director, Gidon Bromberg. Tourists invariably get photographed floating belly-up in the warm water, buoyed by a salinity more than eight times the ocean average. The impact on the Dead Sea's unique ecology and related tourism would be astronomical if either the algae popped up or the gypsum changed the water's color, Bromberg said.

"You are certainly going to reduce the salinity, but it's still going to be high enough to float," he added. "But would you want to float with slime? It's not existent in the Dead Sea at the moment. If

the Dead Sea turns into a milky white, are you going to want to float? The two bodies of water will not mix -- it's like bringing oil and water together."

Doron Markel, Israel's representative at the Study Management Unit for the International Feasibility Study for the Red Sea-Dead Sea convergence, was less concerned about the gypsum.

"So there will be a whitening effect. So what? The research said it may be suspended on top, but they don't know," he said. "However, they found a way to mitigate the problem. They found that by adding gypsum it will coagulate and sink it to the bottom."

Affordable Water?

Gypsum or not, there's also the production of water, a big issu ein this parched part of the Middle East.

But FoEME Jordanian director Munqeth Mehyar is under the impression the World Bank's feasibility report fudges the real numbers. The report listed a potential benefit of $10 billion over 50 years, based on the increased availability of water as a result of the project, but it calculated that number on the cost of tankered water. That's the most expensive option to obtain water in Jordan.

In reality, the feasibility study states that the cost of a cubic meter of water via the Red Sea-Dead Sea conduit would be up to $2.70, which is nearly triple the current cost of a cubic meter of fresh water to Amman residents. The cost to Israel and the Palestinian Authority would be up to $1.85 per cubic meters. Israel's Mediterranean desalination plants produce drinking water for an average price of $0.61 per cubic meters.

The feasibility study also estimates a benefit of $1.4 billion from the generation of hydropower over 50 years, being the total amount of hydroelectricity generated multiplied by the difference between the long-run marginal cost and the actual unit cost of producing hydroelectricity. But the two power stations connected to the conduit would create just 251 megawatts of electricity altogether, not enough to pump the projected 800 million cubic meters per year of desalinated fresh water to Amman.

So the project would be in a power deficit to the tune of 880 megawatts, and that's without calculating the cost to pump water to Israel and the Palestinian territories. To make up for that, it would require two new power stations that would double the project's carbon footprint. The report says those "conventional" power stations would push emissions of CO2 per year to 650,000 metric tons by the year 2020.

Building Peace, Or Maybe Not

Israel's Markel said the three governments have worked well together on the conduit project so far, which is an effective mechanism for peace-building.

But the devil is in the details. The governance structure laid out by the World Bank requires recognition of all parties' riparian rights to the Dead Sea, but the West Bank that borders the Dead Sea is still under Israel's control, as it has been since 1967. Project financing is dependent upon Israeli leadership recognizing Palestinian sovereignty of the Dead Sea in the West Bank. That is unlikely, given the stalled peace process.

There's also the security risk. The preferred route of the conduit is solely on Jordanian territory. Israeli investment could be a hard sell if the conduit is vulnerable to the tap being turned off in the event of war. Jordan, while formally at peace with Israel, previously turned down a proposed conduit from the Mediterranean for the same reason.

Then there's the potential for terrorist attacks, such as those that have occurred repeatedly on the gas pipeline from Egypt to Israel in the Sinai.

The initial stage of the conduit project would produce 230 million cubic meters of fresh water for Amman and 60 million each for Israel and the Palestinians by 2020.

It's a minimal amount of water for Israel compared to the some 600 million m3 it will desalinate on the Mediterranean by the end of 2014. But it would service the Arava region, which is water-poor. And, anyway, Israel's main concern is saving the Dead Sea, said Maya Eldar from Israel's Ministry of Regional Development.

"Doing nothing is not an option," she said.

Eldar's team supports a pilot stage for the conduit, but the feasibility study indicates that the design requires 75 percent of the full scale of the project to be built in order to meet the project's objectives and not encounter a cumulative loss of $3 to $4 billion. "The first phase would not even cover the interest on the finance needed to build [it], let alone cover the operating and maintenance costs," the report said.

Markel, the Israeli representative at the conduit's study management unit, agrees: "We suggest a very careful step. Start with a slow stage one," he said.

Alternatives

FoEME threatened to take the World Bank to the inspections panel -- an independent complaints mechanism for people who believe they have been, or are likely to be, adversely affected by a World Bank-funded project -- over its failure to initiate a study of alternatives to the conduit.

"We don't think it was so much the Bank, but our own governments that didn't want the alternatives report," said Bromberg, who claimed there are a handful of companies that stand to make big bucks from the conduit's construction. (He declined to name them, as the work is still in its early stages.)

"The alternatives study is making life difficult for those who want to build the Red-Dead canal," he said, mentioning the World Bank's look at other possible ways to tackle the project.
That study compares the conduit proposal with roughly 20 alternatives, or combinations of alternatives, to meet the project's aims.

One combination suggested that the project's objectives could be met without the big price tag or environmental risks by doing a number of things together. This would include rehabilitating the Lower Jordan River; adding desalination plants in Aqaba and on the Mediterranean coast; importing water; improving water recycling and conservation; and taxing the Dead Sea companies for the water they evaporate. It could also be implemented incrementally, allowing room for technological advancement.

FoEME has long argued that replenishing the lower course of the Jordan is the answer to the Dead Sea's decline, considering it is its natural life source.

The flow rate of the Jordan River once was 1.3 billion cubic meters per year; as of 2010, just 20 to 30 million flowed into the Dead Sea. The reason for this is because its fresh water is diverted by Israel, Syria and Jordan.

The European Union last year funded FoEME to develop a master plan to restore the Lower Jordan.

Markel countered that this combination of alternatives was still at concept stage, it was unrealistic, and that FoEME had an agenda of its own. "There's no alternative for fresh water to flow in the Jordan River into the Dead Sea," he said. "We don't have this water; nobody will produce this water and discharge it into the Jordan."

A report on the public hearings is due to be published in Israel in mid-March, but any decision on how to move forward will have to be taken by Israel's government. But after January's general elections, outgoing Prime Minister Benjamin Netanyahu still hasn't cobbled together a new majority. And a hot summer, with its increased rate of Dead Sea evaporation, looms.

"$10 Billion Red Sea-Dead Sea Middle East Water Project Roiling, Again, Israel, Palestinians, And Jordan", 08/03/2013, online at: http://www.ibtimes.com/10-billion-red-sea-dead-sea-middle-east-water-project-roiling-again-israel-palestinians-jordan

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❖ Israel water firm to bring technologies to India

Whitewater Technologies, provides software for water projects, signed a MOU with Tatva Global Water Technologies of Mumbai.

An Israeli "smart water" network- software management firm will be setting up shop in India after signing a cooperation agreement with an Indian environmental infrastructure firm this week.

Whitewater Technologies, which provides software tools for overseeing water quality and operations, signed a memorandum of understanding with Tatva Global Water Technologies, a Mumbai-based giant that provides environmental and waste-management solutions for cities, towns and industries all over the subcontinent.

Whitewater will bring to India its WaterWall information technology, which performs analytics, automates procedures and provides security to water supplies, as well as its BlueBox intelligent water analytics system, which analyzes water quality in real time and detects abnormal events, the company said.

Tatva and Whitewater representatives are mapping out their existing pipelines and exploring the potential scope of the technologies, the firms said in a press statement.

"This agreement will enable us to penetrate the Indian market, focusing on our core water quality and security competencies," Whitewater Technologies CEO Issey Ende said. The relationship between the two firms will be a complementary, mutually beneficial partnership, he said.

"Tatva has a wealth of water quality and network-efficiency knowledge that we are certain will lead to successful delivery of any solution," Ende said. "Together, we will generate a set of solutions covering the needs for online water-quality monitoring and critical security awareness."

Tatva will represent and speak on behalf of Whitewater at the upcoming India Water Expo in Ahmedabad and at the Everything About Water Expo in Chennai, the statement said.

"Tatva Global Water Technologies specializes in providing utility services and implementation of commercial and technical systems in the water utility industry," Tatva CEO K. Ashok Natarajan said. "We feel that the partnership with Whitewater provides a unique combination of industrial solutions and water-management systems aimed at improving overall utility performance and efficiency."

"Israel water firm to bring technologies to India", 07/03/2013, online at:
http://www.jpost.com/Business/BusinessNews/Article.aspx?id=305699

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❖ Israel to assist Rajasthan in water management

Jaipur: Israel has agreed to share technological know-hows with Rajasthan in fields of agriculture and water management.

Israeli Ambassador Alon Ushpiz met Chief Minister Ashok Gehlot on Thursday to discuss ways to enhance tie-ups and collaboration.

The Ambassador of Israel to India, who was on a two-day visit here, also laid the foundation stone for an Indo-Israel Centre of Excellence (CoE) for Pomegranates along with the state Agriculture minister Harjiram Burdak in Bassi town near here.

He informed that three Indo-Israel CoEs are in various stages of development in Rajasthan for transfer and adaptation of Israeli technologies and know-how to farmers in the state.

In addition to Bassi, a centre dedicated for citrus is in the works in Kota and in Jaislamer.

"Israeli experts are working together with local counterparts on prototypes of palm trees, in an aim to develop a date growing industry in the state.

In addition to these Government initiatives, a private sector venture of Israeli olive plantations has started to bear fruit in various sites across the state," a release said.

"Israel to assist Rajasthan in water management", 08/03/2013, online at: http://daily.bhaskar.com/article/RAJ-JPR-israel-to-assist-rajasthan-in-water-management-4201327-NOR.html

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❖ UK invites Israeli innovators to water summit

In an attempt to strengthen future water innovation partnerships between Israel and the United Kingdom, the British Embassy will be bringing 14 water technology companies to an upcoming UK water summit.

Leading the companies to London for the World Water-Tech Investment Summit will be the embassy's UK-Israel Tech Hub, whose mission is to encourage technological partnerships between the two countries as a mechanism for economic growth, according to the embassy.

The companies chosen to participate are a mix of small and large water corporations with expertise in desalination, waste-water treatment, smart water management and drip irrigation.

"There is enormous potential for a partnership between British business and Israeli water tech," said British Ambassador to Israel Matthew Gould. "Israeli water tech can go global through partnering with British business, and British business can get a global competitive advantage from partnering with Israeli water tech. There are huge synergies to be had. Whether it is Israeli startups teaming Britain's world-leading engineering consultancies to reach their global clients, or enabling British industrial companies to treat their waste-water more efficiently and at lower cost, water-tech partnerships can deliver tremendous value both to Israel and to the UK."

While the group is at the summit, Gould will be meeting with them as well as delivering opening remarks at Bloomberg New Energy Finance's Water Briefing reception, which is being organized in conjunction with the Israeli Embassy in London's commercial office, the embassy to Israel noted.

The specific Israeli companies joining the delegation include Mekorot, Booky Oren Global Water Technologies, Kinrot Ventures, Whitewater Technologies, Applied CleanTech, Aqwise – Wise Water Technologies, RWL Nirosoft, Mapal Green Energy Ltd., IOSight, AGM Communication & Control Ltd., Top-It-Up, Netafim and TaKaDu, the embassy said.

Group members will attend a workshop together with British water professionals to talk about pursuing joint projects, and they will also spend a day with the Arup Group Limited – a London-based engineering, design and planning consulting firm – to explore capitalization of global water opportunities, the embassy added.

"To meet the needs of a global water market we need to explore innovative solutions throughout the supply chain," said Mark Fletcher, global water leader at Arup. "We look forward to hosting this Israeli water delegation and identifying short- and long-term opportunities to work with Israeli businesses to deliver value to our clients."

"UK invites Israeli innovators to water summit", 05/03/2013, online at: http://www.jpost.com/Sci-Tech/Article.aspx?id=305353

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❖ MK: Israel's Water Guaranteed 'Chametz-Free'

Israelis will again drink underground "well water" this Passover, because of fears that the Kinneret may contain chametz.

Israelis may not realize it, but duringPassover, their water comes not from the Kinneret, but from underground wells. “It has been like this for years, and will continue this year,” said MK Moshe Gafni (United Torah Judaism).

In a letter to Gafni, Alexander Kushnir, the chairman of the Israel Water Authority, said that this year, as in years past, the Authority would stop pumping water from the Kinneret into the National Water Carrier three days before Passover. Instead, the Authority will pump water from underground wells into the water system.

In a request to Kushnir for clarification on the matter, Gafni said that in the past, many Israelis did not drink water from the tap out of fear that it contained chametz, the leavened material that is forbidden for consumption by Jews on Passover. “The fear is that chametz could be present because the Kinneret is an open body of water.” Pumping water from the underground wells, where it was far less likely that bread of other chametz could reach, was acceptable to everyone, Gafni said.

The Kinneret will “rest” throughout the holiday. Pumping of water from the large fresh water lake, via the National Water Carrier, will begin after Passover has passed.

“MK: Israel's Water Guaranteed 'Chametz-Free'”, 03/03/2013, online at:
http://www.israelnationalnews.com/News/News.aspx/165830#.UTj9ltbwmz4

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❖ Israel offers positive water policy example to the region - the Palestinians, sadly, offer the opposite

When one enters "Israel scenery" into a Google image search, many images of the desert come up. When non-Israelis are asked to describe what they think Israel must look like, the common answer includes sand dunes, rocky desolate hills dotted with palm trees and camels - always camels. This is unsurprising, since geographically two-thirds of the country is indeed desert.

Yet the Google search image results also reveal something incredible about the Israeli desert - it blooms, in the words of David Ben-Gurion, Israel's first Prime Minister and the visionary of its successful water management policy.

Located in one of the driest regions in the world, water is a constant concern for Israel, and such concerns have occasionally played a part in past wars with its neighbours. It has also been repeatedly claimed that future clashes in the region might also revolve around access to water.

Yet through resource management, innovation and planning, the Israeli water authorities have effectively alleviated many of these concerns, and have now beaten the intense drought which has gripped the country for several years. And this has been achieved not simply through a change in the weather, but through changes in policy and the building of infrastructure, which Israel's authorities assert, have essentially rendered the country drought proof - as outlined in a new feature article published in the *Times of Israel*. Now, the Israeli example stands ready to help others in the region to do the same. Unfortunately, not everyone is ready to take advantage of this opportunity. In particular, the Palestinian leadership unfortunately and short-sightedly seems more interested in blaming Israel for their water problems than overcoming them with Israel's help.

How did Israel deal with the water scarcity? The first water project, the National Water Carrier, was in the planning even before Israel was established, and its construction was in full swing since the country's early days. It's a system of canals, pipes and tunnels delivering water to the more barren parts of the country from the Sea of Galilee (the *Kinneret*, in Hebrew).

Since then, as demand rose, new solutions were found: 80% of purified sewage water in Israel is recycled and used in agriculture and industry- the highest percentage in the OECD, by a very large margin. Water-efficient technologies, such as drip irrigation, were developed to allow for agriculture to thrive in the dry desert regions. These days the main national water project is desalination, with

three desalination plants already operational, and another two in advanced construction stages. By the end of the year, 50% of water consumed in Israel will be artificially manufactured water, either in desalination plants, or purified sewage and brackish water.

The *Times of Israel* article further notes that, thanks to strong conservation measures, Israel now actually consumes somewhat less total water overall than it did a decade ago, despite strong population and economic growth. Furthermore, Israel has much lower per capita fresh water use (that is not including desalination or wastewater recycling) than virtually all its neighbours, excepting the Palestinians - in 2006 Israel averaged 152 cubic metres as a multiyear average, but this has since fallen somewhat further. At that time, Jordan averaged 949, Syria 861, Egypt 732 and Jordan 172 cu. meters per capita per annum. The West Bank averages around 140.
Israel's water solutions can be implemented across the region, to deal with similar concerns in Jordan, Gaza and the West Bank.

A new study of regional water problem by Jay Famiglietti of the University of California, Irvine, described in *National Geographic*, concluded that:
In the Middle East, some countries, notably Israel, are pioneers of efficiency, while others are less advanced. Much of the technology is in place. It just needs to be disseminated and embraced across the entire region.

Cooperation and shared knowledge, expertise and technology can address the region's water concerns in a way that will not only improve the quality of life for millions in the region and enable greater and more sustainable economic and demographic growth, but also resolve one of the standing issues in the Israeli-Palestinian negotiations.

Indeed, cooperation on water issues with Jordan provides a positive example. Israel supplies Jordan with 70 million cubic meters of water annually, in line with the formal agreements between the countries. The agreements also institutionalised issues of drilling rights and the two countries work efficiently together, with mutual respect and with an understanding of the mutual interest.

Dealing and cooperating with the Palestinians on water issues is, unfortunately, a different story altogether. Israel is obliged by the Oslo Accords to supply the Palestinian Authority with 31 million cubic meters of water annually, but has actually supplied considerably more than this in most years.

Yet unlike Jordan, when efforts are made to develop infrastructure to increase water availability (water delivery, desalination in Aqaba, more efficient use of brackish water), the PA does very little to develop its water infrastructure, and its over-drilling and illegal wells run the risk of permanently damaging the aquifers they access. While there are established channels of communication and cooperation between Israel and the PA, as agreed upon in the Oslo Accords, the head of the PA's water authority (PWA), Dr. Shaddad Attili, apparently prefers to level accusations against Israel - about alleged over-charging for water, demolition of illegal wells and refusing to approve new drillings - rather then developing an independent and viable water infrastructure with the help of Israeli water experts as provided for in the agreements

Obviously, it is very counterproductive to simply blame Israel for Palestinian water problems and refuse to cooperate with it on water issues - especially when Israel's water solutions can very well be the answer to dealing with water scarcity on a regional level. This only serves to perpetuate the water shortage in drought-stricken territories. So why are the Palestinians turning their backs on fairly obvious solutions to their water worries at the expense of their own population, economy, industry and agriculture interests? Commentators have suggested that it is simply in line with their overall strategy of rejecting cooperation and negotiations on all issues in an attempt to promote unilateral statehood.

The dispute over water, as far as the PA is concerned, does not seem to be a shared regional challenge, to be solved through negotiation, compromise and cooperation. It appears they don't see water scarcity as a problem which ought to be solved, as Israel has, but rather as yet another politicised issue on the long list of alleged evils and wrongdoings to be raised against Israel on the diplomatic international stage.

The facts are, however, that Israel is keeping all of its water-related obligations under the Oslo Accords, including cooperation in a Joint Water Committee (JWC), which was brought to a halt by the Palestinians' lack of cooperation. The Palestinian policy, thus, leads to grave and disappointing results - as Palestinian waste water threatens to contaminate precious underground water resources in the West Bank, harming both Israelis and the Palestinians themselves. This is despite the flow of international aid funds available to treat and reuse such waste water, and Israeli offers to help finance Palestinian waste water treatment projects and build a joint desalination plant to accommodate Palestinian water needs.

The Palestinian leadership seems to be stubbornly perpetuating the water problems in the Palestinian territories while refusing to cooperate with Israel, which holds the key to their solution. Needless to say, this is not what a mature and pragmatic leadership, which aspires to meet the requirements for statehood, should be doing.

"Israel offers positive water policy example to the region - the Palestinians, sadly, offer the opposite", 10/03/2013, online at: http://www.aijac.org.au/news/article/israel-offers-positive-water-policy-example-to-t

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❖ Israeli water is cool in the UK

British environment minister Richard Benyon welcomed a 14-strong group of Israeli water company delegates at the Foreign Office on Tuesday, for an event organised by UK Trade and Investment (UKTI).

Mr Benyon said he wanted "to attract inward investment to the UK" as the Israeli group joined more than 150 representatives from India, Europe and the USA.

"While it is energy security that makes the headlines, it is water security that is critical to life," said Mr Benyon.

Led by the British Embassy's UK-Israel Tech Hub (UITH), the Israeli delegation of water technology companies, experts and entrepreneurs arrived in the UK for four days of meetings with British counterparts.

"First and foremost we're looking for commercial partnerships," said UITH director Naomi Krieger.

"A lot of people perceive the Israeli and British water systems to be very different — but they're not. They're both renowned globally in the water industry — the British companies are also world leaders in Africa and Asia."

What can the Israelis offer the Brits? "The Israeli companies we've brought are leaders in waste water management systems and applying data technology to how we use and preserve good quality water. There's potential to develop company relationships and come up with solutions together."

Yoni Dolgin, clean-tech manager at the Hub, said: "The water sector is a major area of co-operation between the UK and Israel.

"Israel is considered a global leader in water treatment and waste water re-use for agricultural purposes — we want to help Britain identify solutions as 30 to 40 per cent of water in Britain is often lost in leakage before it reaches the taps."

British ambassador to Israel Matthew Gould added: "There are huge synergies here. Israeli water-tech can go global through partnering with British business, and British business can get a global competitive advantage from partnering with Israeli water-tech.

"Whether it is Israeli start-ups teaming up with Britain's world-leading engineering consultancies, or enabling UK firms to treat their wastewater more efficiently and at lower cost, water-tech partnerships can deliver tremendous value."

"Israeli water is cool in the UK", 07/03/2013, online at: http://www.thejc.com/news/uk-news/103188/israeli-water-cool-uk

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❖ Analysis: Export oil, import water – the Middle East's risky economics

DUBAI, 5 March 2013 (IRIN) - The world's driest region, the Middle East and North Africa (MENA), is getting drier at an alarming rate.

And yet, despite massive population growth (the Middle East's population grew 61 percent from 1990 to 2010 to 205 million people)* predictions of so-called "water wars" have failed to materialize.

So how has a region that water experts say ceased to have enough water for its strategic needs in1970 proved so resilient to water scarcity?

"Trade is the first means of being resilient; it's the process that enables an economy to be resilient. The ability to trade effectively depends on the strength and diversity of the economy," Anthony Allan from King's College London and the School of Oriental and African Studies told IRIN.

That does not literally mean that countries import water directly; it is rather that because so much water is used, not for drinking, but for agriculture (around 90 percent), by importing food staples like wheat you are in effect importing water, something Allan calls "virtual water".

As a result, the region's growing population imports around a third of its food - a figure that shoots up in the Gulf states where arable land is negligible.

But while such resilience may "miraculously" solve extreme water scarcity and make life that exists today possible in the Middle East, it can create its own vulnerabilities; countries need economies that can generate enough foreign currency to pay for imports.

That may be easy in oil-rich countries with small populations like the United Arab Emirates (UAE) and Qatar, but it is far more difficult in places like Egypt, which struggles to find the reserves to pay for wheat imports for its 84 million citizens in a context of declining crude oil exports and a slump in tourism.

Such trade "resilience" is also largely unaffordable in a place like Yemen - the region's poorest country, which has 25 million people in an extremely water scarce (and hence food scarce) environment.

Each Yemeni only has access to about 140 cubic metres of water annually and the capital, Sana'a, is on track to be the first in the world without a viable water supply.

An uncertain future

While trade, an abundance of historically cheap food on international markets, and for some oil - sold at high prices - have combined to create an unexpected resilience in the face of water scarcity, such lessons may not travel well in the developing world.

Trade may have reduced dependency on local water supplies, but it has shifted dependency to international markets and exposed people to fluctuating world prices.

"Water scarcity is not new to the region"

It has also hidden the gravity of the water scarcity situation in the Middle East and made it easier to neglect the development of other solutions to a problem that shows no sign of going away.

A recent study of NASA satellite data published last month found that parts of Turkey, Syria, Iraq and Iran along the Tigris and Euphrates river basins had lost 144 cubic kilometres of water from 2003 to 2009 - roughly equivalent to the volume of the Dead Sea.

An analysis of the data published in the Water Resources Research journalattributes about 60 percent of the loss to the pumping of groundwater from underground reservoirs - reserves people fall back on when rivers dry up.

Underground reserves can only last so long, and importing ever increasing amounts of food to feed a growing population is not an option for poorer countries.

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Resilience and efficiency

Nevertheless, there are other lessons in water scarcity resilience from the Middle East - either measures that have been shown to build resilience, or that water experts have come to understand would improve the strength of the system to further shocks if they were broadly implemented.

Some of these solutions are not new.

For a start, though the region may be drying, it has been dry for a long time.

"Water scarcity is not new to the region," Hamed Assaf, a water resource management specialist at the American University of Sharjah in the UAE, told IRIN. "It has been the norm for thousands of years and people have adapted their survival strategies to changes in rainfall and temperature," he told IRIN.

With scientist predicting an increase in extreme weather events, adaptability has become increasingly important. It is also true that there remains a degree of unpredictability in the system, particularly in Egypt where it is not clear if future rainfall will increase or decrease.

Resilience is about being strong in the face of whatever happens. And in any situation, strong water systems make the most of what they have - including through treating and reusing waste water like at the Al Gabal Asfar water treatment plant in Egypt.

Rainwater harvesting

One old technique is rainwater harvesting. "In Jordan there are indications of early water harvesting structures believed to have been constructed over 9,000 years ago," Rida Al-Adamat, director of the Water, Environment and Arid Regions Research Centre at Jordan's al-Bayt University, told IRIN.

Jordan harvests 400-420 million cubic metres of water annually, according to Ministry of Water and

Irrigation spokesperson Omar Salameh.

"We have 10 major dams with a total capacity of 325 million cubic metres, in addition to hundreds of sand dams in different locations to develop local communities and recharge groundwater."

Water harvesting can be done at the household level especially in areas that get enough rainfall during the rainy season. "If your area gets 500mm of rain per year, you can collect enough water for household use," said Assaf.

"In Lebanon, people used to build ponds to collect water during winter and use it later on for irrigation and breeding animals," said Assaf.

"The main idea of water harvesting is to increase green water or soil moisture… Farmers in the region used to build small sand barriers on slopes to prevent the water from going down and thus recharge the area. Then they used to plant in the areas behind the barriers," he added.

Data collection

A key aspect of efficient water use is data collection - important for sound water management at the country level.

"As the saying goes: what you cannot measure you cannot manage," Heba Yaken, water and sanitation operation analyst at the World Bank office in Cairo, told IRIN. "It is important to know how much you are consuming in order to manage it in a good way."

Jordan, which some say has one of the most monitored water scarcity situations in the world, has gained widespread recognition for its data collection.

"Jordan's data is relatively well organized, especially when it comes to agriculture. The volume of water consumption is precisely known in every area. They have installed measuring tools in every area so they know what kinds of crops are being cultivated and the amount of water they consume,"

Hiba Hariri from the Arab Water Council told IRIN.

Data-sharing in the region is limited, according to Yaken. "Countries are not as transparent as they should be," she said.

Other solutions

A whole range of solutions are being piloted and recommended in the Middle East.

In Egypt, the Arab Spring has encouraged farmers to become more outspoken in demanding their water rights, says Yaken from the World Bank.

Farmers have come together in "water users' associations" to help manage supplies and become more aware of water scarcity issues.

"Farmers are now responsible for the `mesqas' [canals]", Yaken told IRIN.

"People at the tail of the `mesqa' don't get as much water as the people upstream. People are receiving much more training so that they can manage those disputes between the different farmers, and different demands," she said.

Elsewhere, capacity building is being carried out by the German Agency for International Cooperation (GIZ), which is running a climate change adaptation scheme designed to help Arab states climate-proof water systems.

While trade provides substitutes for much agricultural water use, the remaining 10 percent of water needs are increasingly being met by desalination, half of which globally is carried out in the Middle East.

Recent years have seen a large increase in desalination, clearly useful in a region without any landlocked countries, but it is an energy-intensive phenomenon almost entirely powered by fossil fuel

power, which raises other environmental concerns.

Saudi Arabia uses 1.5 million barrels of oil a day to power its desalination plants, although it is looking to develop solar-powered plants.

Solar is a largely unexplored option for desalination, but also for increasing the efficiency of water systems, through technologies like solar-powered water pumps.

Consumption

But although desalination may become an increasingly affordable, and renewable, solution, water experts say it can only be used as part of wider reforms.

A more resilient water system will also need adaptions on the demand side, including more efficient consumption of water, as well as cooperation between countries on the sustainable use of current resources.

"The problem is that we have short-term plans that change with the change of personnel or ministers," said Hariri from the Arab Water Council.

As climate change and population growth increase pressure on water systems, the MENA region will need to be increasingly efficient in its use of water - and may have lessons for other parts of the world.

*The definition of Middle East used in the OECD/World Bank figures is Bahrain, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, UAE, Yemen, but not Israel or OPT.

"Analysis: Export oil, import water – the Middle East's risky economics", 05/03/2013, online at: http://www.irinnews.org/Report/97596/Analysis-Export-oil-import-water-the-Middle-East-s-risky-economics

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❖ Nile: Ethiopia to Ratify Framework Agreement

Ethiopia begins a process to ratify the Nile Basin CooperativeFramework Agreement (CFA) into legislation by the House of Peoples Representatives.

The CFA, which is signed in May 2011 by six of the Nile Basincounties including Ethiopia, seeks to establish a permanent River Nile Basin Commission through which member countries of the basin will jointly manage and develop resources of the Nile, the longest river in the world.

"We have now started a process to have the CFA ratified into alegislation," Reta Alemu, Director of International Legal Affairs Directorate General at the Ministry of Foreign Affairs (MoFA), said Tuesday at a consultative meeting organized by the Ministry of Water and Energy (MoFA) and the Ethiopian Nile Discourse Forum (EthNDF).

Ethiopia put a hold on the ratification process to allow Egypt, which is yet to sign the CFA, regain political stability following months of unrests that led to the formation of a new government.

"The six countries that signed the CFA have agreed to proceed with a process to ratify the treaty into legislation," Reta said.

The upstream countries that have so far signed include Ethiopia, Rwanda, Burundi, Uganda, Kenya and Tanzania. All six parliaments are expected to ratify the CFA.

The Democratic Republic of Congo has not signed yet while the world's newest country, South Sudan, could accede to the treaty.

Egypt and Sudan have persistently refused to sign the agreement which, if signed and ratified by governments, could end their hegemonic control over the waters.

Egypt wants to maintain its 'historic rights' that emanated from a 1929 colonial-era treaty signed with Britain. The treaty gave Egypt veto rights over all upstream projects. A subsequent 1959 treaty between Egypt and Sudan also gave the two downstream countries over ninety percent control of Nile waters.

"Nile: Ethiopia to Ratify Framework Agreement ", CFA, 08/03/2013, online at: http://www.dailyethiopia.com/index.php?aid=1352

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❖ Ethiopia, Saudi Arabia in row over Nile River dam Project

ADDIS ABABA: Ethiopia has demanded that Saudi Arabia explain itself after a minister attacked the country over its massive Renaissance Nile River dam project, saying that the water rights of Sudan and Egypt would be threatened with its completion.

"The Renaissance dam has its capacity of flood waters reaching more than 70 billion cubic meters of water, and is located at an altitude of 700 meters and if it collapsed then Khartoum will drown completely and the impact will even reach the Aswan Dam," the Saudi Deputy Defense Minister, Khalid Bin Sultan said at the meetings of the Arab Water Council in Cairo last week.

The $4.8 billion Renaissance Dam is currently under construction and is scheduled for completion in 2015.

The Saudi official further accused Ethiopia of being keen on harming Arab nations.

"There are fingers messing with water resources of Sudan and Egypt, which are rooted in the mind and body of Ethiopia. They do not forsake an opportunity to harm Arabs without taking advantage of it," Prince Khalid said.

"The establishment of the dam leads to the transfer of water supply from the front of Lake Nasser to the Ethiopian plateau, which means full Ethiopian control of every drop of water, as well as [causing] an environmental imbalance stirring seismic activity in the region as a result of the massive water weight laden with silt withheld in front of the dam, estimated by experts at more than 63 billion tonnes," he added.

Ethiopian foreign affairs ministry spokesperson, Ambassador Dina Mufti said the accusation was "unexpected and shocking."

The dam project has seen widespread concerns from Egypt and Sudan, who have echoed the Saudi official's sentiments over the project, which they see as an infringement on their historical rights to Nile water.

The dam could threaten the regional stability after the Egyptian government said it remained "concerned" over Ethiopia's actions along the Nile River.

The International Monetary Fund (IMF) has also called on Addis Ababa to push the dam project to the backburner in order to focus on other economic initiatives.

While Cairo has denied any intention of attacking the dam, as reported by whistleblower website Wikileaks, the country's Water Resources and Irrigation Minister Mohamed Bahaa el-Din said last

month that his country was maintaining its concerns about the construction of the Renaissance Dam in Ethiopia.

He did say that officials at the Ethiopia foreign ministry "assured Egypt and Sudan that in case there was any impact on their water quota to the dam, other projects will be carried out to collect lost water and cover shortages."

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."

Ethiopia's massive dam project has seen much concern from Cairo and Khartoum, who fear the establishment of Africa's largest dam would affect previous colonial deals on Nile water-sharing.

It is to be built some 40 kilometers upstream from Sudan on the Blue Nile.

But even before the official announcement of Ethiopia's prime minister's passing on August 20, Egyptian officials told Bikyanews.com that they believed a post-Meles region could bring forth new negotiations and compromise over Nile water.

An Egyptian ministry of water and irrigation told Bikyanews.com last year, two weeks before Zenawi was pronounced dead, that with the combination of Egypt's new President Morsi and the potential of seeing a new leader in Ethiopia, they hoped the tension over Nile River water could be resolved.

"While this can in no way be official policy at this point, I believe that there would be more maneuvering with a new leadership in Ethiopia because there would be the ability to communicate and not be seen as antagonistic," the official said, adding that they were not authorized to speak to the media.

"Let us be frank about the situation between Egypt and other Nile countries," the official continued. "We in Egypt have not been the best at compromise so I think overall, there is so much that can be done to help bring countries together, and Ethiopia has been a leader in its criticism of Egypt so starting there would be good."

With the Nile comes a new set of issues, and with Egypt holding onto a lion's share of water from the world's largest river, upstream countries such as Ethiopia have taken it on their own to begin building dams and other water related endeavors, much to the anger of Cairo.

However, officials hope that solutions can be had in the new post-revolution Egypt that could see the growing tension between countries along the Nile reduce.

"While Egypt never wants to mingle in another country's affairs, a new leadership in Ethiopia would go a long way to changing how things are run, just like it has in Egypt," the official added.

"Ethiopia, Saudi Arabia in row over Nile River dam Project", 09/03/2013, online at: http://bikyanews.com/86433/ethiopia-saudi-arabia-in-row-over-nile-river-dam-project/

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❖ World's largest desalination plant planned for Saudi Arabia

The Saline Water Conversion Corporation (SWCC) is planning on building a 600,000 m^3/day desalination facility, according to the Saudi Press Agency.

The new facility will be designed to meet the needs of northern Jeddah, Makkah and Taif. The SWCC director-general reportedly said that the production of the existing Rabigh**desalination** plant will be raised to 20,000 m^3/day to supply Khulaiss and Rabih governorates.

Construction of the plant is expected to start at the beginning of 2014 and will be finished in 2018.

Saudi Arabia is considered one of the largest desalination companies in the world, supply 3.3 million cubic meters daily.

SWCC runs more than 30 desalination plants on the Red Sea and the Gulf. At the end of 2012 contracts were signed for the third phase of the Yanbu-Madinah desalination project.

"World's largest desalination plant planned for Saudi Arabia", 07/03/2013, online at: http://www.waterworld.com/articles/2013/03/worlds-largest-desalination-plant-planned-for-saudi-arabia.html?cmpid=$trackid

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❖ Why food riots are likely to become the new normal

The link between intensifying inequality, debt, climate change, fossil fuel dependency and the global food crisis is undeniable

Just over two years since Egypt's dictator President Hosni Mubarak resigned , little has changed. Cairo's infamous Tahrir Square has remained a continual site of clashes between demonstrators and security forces, despite a newly elected president. It's the same story in Tunisia, and Libya where protests and civil unrest have persisted under now ostensibly democratic governments.

The problem is that the political changes brought about by the Arab spring were largely cosmetic. Scratch beneath the surface, and one finds the same deadly combination of environmental, energy and economic crises.

We now know that the fundamental triggers for the Arab spring were unprecedented food price rises. The first sign things were unravelling hit in 2008, when a global rice shortage coincided with dramatic increases in staple food prices, triggering food riots across the middle east, north Africa and south Asia. A month before the fall of the Egyptian and Tunisian regimes, the UN's Food and Agriculture Organisation (FAO)reported record high food prices for dairy, meat, sugar and cereals. Since 2008, global food prices have been consistently higher than in preceding decades, despite wild fluctuations. This year, even with prices stabilising, the food price index remains at 210 – which some experts believe is the threshold beyond which civil unrest becomes probable. The FAO warns that 2013 could see prices increase later owing to tight grain stocks from last year's adverse crop weather.

Whether or not those prices materialise this year, food price volatility is only a symptom of deeper systemic problems – namely, that the global industrial food system is increasingly unsustainable. Last year, the world produced 2,241m tonnes of grain, down 75m tonnes or 3% from the 2011 record harvest.

The key issue, of course, is climate change. Droughts exacerbated by global warming in key food-basket regions have already led to a 10-20% drop in rice yields over the past decade. Last year, four-fifths of the US experienced a heatwave, there were prolonged droughts in Russia and Africa, a lighter monsoon in India and floods in Pakistan – extreme weather events that were likely linked to climate change afflicting the world's major food basket regions.

The US Department of Agriculture predicts a 3-4% food price rise this year – a warning that is seconded in the UK. Make no mistake: on a business-as-usual scenario, this is the new normal. Overall, global grain consumption has exceeded production in eight of the past 13 years. By mid-century, world crop yields could fall as much as 20-40% because of climate change alone.
But climate is not the only problem. Industrial farming methods arebreaching the biophysical limits of the soil. World agricultural land productivity between 1990 and 2007 was 1.2% a year, nearly halfcompared with 1950-90 levels of 2.1%.

2008 also saw a shift to a new era of volatile, but consistently higher, oilprices. Regardless of where one stands on the prospects for unconventional oil and gas for ameliorating "peak oil", the truth is that wewill never return to the heyday of cheap petroleum.

High oil prices will continue to debilitate the global economy, particularly in Europe – but they will also continue to feed into the oil-dependent industrial food system. Currently, every major point in industrial food production is heavily dependent on fossil fuels. To make matters worse,predatory speculation on food and other commodities by banks drives prices higher, increasing profits at the expense of millions of the world's poor.

In the context of economies wracked by debt, this creates a perfect storm of problems which will guarantee high prices – eventually triggering civil unrest – for the foreseeable future.

It's only a matter of time before this fatal cocktail of climate, energy and economic challenges hits the Gulf kingdoms – where Saudi Arabia is struggling with an average total oil depletion rate of about 29%. If oil revenues reduce in coming years, this would lower subsidies for food and fuel. We've

already seen how this can play out, for instance, in Egypt, whose domestic oil production peaked back in 1996, reducing government spending on services amid mounting debt.

The link between intensifying inequality, debt, climate change, fossil fuel dependency and the global food crisis is now undeniable. As population and industrial growth continue, the food crisis will only get worse. If we don't do something about it, according to an astounding new Royal Society paper, we may face the prospect of civilisational collapse within this century.
The Arab spring is merely a taste of things to come.

"Why food riots are likely to become the new normal", 06/03/2012, online at:
http://www.guardian.co.uk/environment/blog/2013/mar/06/food-riots-new-normal?CMP=twt_fd&utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=1b7c547021-RSS_EMAIL_CAMPAIGN&utm_medium=email

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❖ China's new strategy to develop relations with Africa: dam construction

Even though relations between China and Africa date back more than 2,000 years, a visit by Ibn Battuta, known as one of the greatest travelers of all time, in the 14th century is considered the start of relations.

Battuta was followed to Africa by an expedition by a Chinese fleet admiral and diplomat, Zheng He. He voyaged to Africa during the period of the Ming dynasty, which ruled China for 276 years from 1368 to 1644.

China first established modern diplomatic relations in Africa once Mao Zedong came to power. This was with Egypt in 1956, which can be considered a diplomatic maneuver of Egyptian leader Gamal Abdel Nasser who was anti-West. Egypt nationalized the Suez Canal due to a lack of Western support for the Aswan High Dam and in return encountered a conspiracy devised by France and the UK that led to an Israeli attack on Egypt. Having problems in its relations with the West, Egypt established diplomatic relations with China, which was not yet recognized by "free world" governments. Egypt and the People's Republic of China (PRC) signed an agreement in which China gave 20 million Swiss francs as a financial grant to Egypt for the rehabilitation of the Suez Canal and engaged in cotton trade with Egypt to break an embargo by Western countries.

The relationship between China and African countries really heated up in 1971 when the PRC joined the UN as "China's representative." By 1978, China had established direct diplomatic relationship with 40 different African countries. Mutual relations were established this late because the PRC was not recognized by the international community until 1971, and African countries did not begin gaining independence until the 1950s and 1960s.

In the early 1980s, the trade volume between China and the African continent was around $1 billion, reaching $6.5 billion right before the beginning of the 21st century. There has been a considerable rise since 2005. Reciprocal trade was around $39 billion in 2005, reached $55 billion in 2006, $114 billion in 2010 and $166 billion in 2011. As a result of this rate of increase, it is expected to reach $200 billion in 2012. China sells manufactured goods in return for raw materials and oil from Africa because it has quite limited natural resources. One-third of the oil consumed by China is provided by Africa, especially from Angola, which was considered by China a socialist supporter during the Cold War. In return, China makes certain infrastructure investments, particularly in the energy and water sectors in Angola. China also provides financial aid in the form of grants to African countries, and unlike Western countries, it does not impose any economic or political structural reforms, which is preferred by leaders of the countries and increases the esteem of China in African eyes.

Due to its limited energy resources, China has a hard time meeting the electric power demands of its ever-growing industries. Thus, China attaches great importance on hydroelectric power generation. Having almost half of the large dams in the world in its territories, China has gained substantial

technical expertise in this regard. For many years, China consistently depended on the technical support of Western companies for the dams it built. However, this situation started to change in the 1990s. While the Three Gorges Dam was under construction, China stipulated conditions that half of the turbines to be produced by companies such as Siemens, Alstom and General Electric would be produced in China with Chinese partners. As a result of this investment, Chinese companies obtained turbine technology, and thus, they were no longer dependent on Western companies. China used this experience and ever-rising financial resources to construct dams in Africa through Eximbank.

Sinohydro, established as a public company in 1950, is the top Chinese construction company and one of the biggest construction companies in the world.

The overseas activities of Chinese companies aren't just concentrated in Southeast Asia, but also in Africa. In 2012, Chinese companies took part in construction of 308 dams and hydroelectric plants in 70 countries in the world, with 85 dams constructed in Africa. Western public opinion has certain doubts concerning dams constructed by China due to its companies' low levels of social and environmental concerns. Dam projects that carry high environmental and social risks for Western companies do not present any obstacles to Chinese companies, and the countries in which these companies construct dams are alleged to have records of corruption. Thus, it seems as though Western companies look like they act with environmental, social and political concerns while Chinese companies are more amoral. But the reality is slightly different. Recent history is full of bribery scandals involving Western companies. The most recent example was revealed after a Norwegian company admitted they bribed Uganda's energy minister during the construction of the Bujagali Hydroelectric Power Station in Uganda. In addition, it is also known that people who were displaced due to the construction did not receive sufficient compensation.

The Merowe Dam on the Nile River in Sudan, one of the biggest hydroelectric projects in Africa, and the Gibe III Dam in Ethiopia are the top dams built by China in Africa. Merowe doubled energy generation in Sudan but caused major social problems. During the 1990s, Sudanese authorities tried to find support for the project from Canada and European countries but failed. Arab capital and Eximbank provided financing for the project -- 240 million euros of the project -- of which the total cost was 1.2 billion euros, was financed by China, and it became the biggest foreign investment finance fund of China during that period.

The Chinese Industrial and Commercial Bank of China (ICBC) financed the controversial Gibe III dam to a large extent. During the dam's financing process, the World Bank refused to provide financial support on the grounds that the required social and environmental impact assessments had not been carried out and that the extent of damage that could be done to lower riparian Kenya was ambiguous. Thus, China and the state bank provided a loan of $500 million.

Some of the important projects in Africa in which Chinese banks and companies have taken part are the Felou Hydroelectric Power Plant in Mali on the Senegal River by Sinohydro, the Bui Dam in Ghana on the Black Volta River and the Mekin Hydroelectric Power Plant Project in Cameroon by Sinohydro and Eximbank.

Sinohydro, which is the world's largest Chinese hydropower company operating abroad, adopted a policy on environmental and social impacts in 2011 and announced that World Bank standards would constitute minimum standards. However, the main problem concerns the implementation of this kind of regulation. The low-level environmental standards of the countries in which investments are made and the problems encountered in the implementation of current regulations increasingly lead African countries towards Chinese investments. The fact that Western companies are increasingly under the pressure of environmentalist groups keeps them from taking part in this type of controversial project. The result? Chinese companies do not have any more obstacles before them. Besides this, the rising interdependence between African countries and China also increases these kinds of investment opportunities. Rising interdependence and closer ties makes it possible for China to become influential across almost the whole African continent. The reaction of the "free world" to the rising Chinese influence will determine the future of the African continent.

"China's new strategy to develop relations with Africa: dam construction", Seyfi Kılıç, 10/03/2013, online at: http://www.todayszaman.com/news-309257-chinas-new-strategy-to-develop-relations-with-africa-dam-construction.html

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❖ Droughts raise water supply concerns

Authorities in Yunnan struggle to cope, especially in rural areas

In Wang Lianying's backyard are four basins filled with water thatshe uses for laundry, one each for s oaking, soaping, scrubbingand rinsing.

"The water's good for four or five cycles, at least half a month,"the 69-year-old housewife said.

"Our ox has to drink the water we use for washing our feet.

"But we won't even be able to afford to use any water this way ifthe rain doesn't come in the next few days," she said.

For many villagers like Wang in Songming county, Yunnanprovince, conserving water is not a choic e - it is an absolutenecessity.

Regular droughts in winter, spring and early summer started in2009 and have continued to affect rura l and mountainous areasof Southwest China this year, reshaping the lifestyles of peopleand causing a major shift in the agricultural industry.

The well in Wang's yard has dropped to less than one meterdeep, forcing her to walk 20 minutes a da y to fetch water from anearby reservoir, which is also in danger of drying up.

The lingering drought has hit 15 cities and autonomous prefectures in Yunnan, affecting 5.58million people, according to the latest provincial civil affairs department statistics, and of those, 1.2 million face drinking water shortages.

This year's drought has also caused the loss of more than 557,000 hectares of crops, with70,000 hecta res of land facing complete crop failures - an estimated economic loss of up to2.77 billion yuan ($445.4 million), authorities said.

In Songming county, many crops, such as wheat and peas, planted in mountainous areas, canbe seen withered and dried out.

Ma Jixian, a 60-year-old villager, said shepherds are even being allowed to let their sheepgraze in some fields planted with broad beans. "This is the only use for these crops now," hesaid.

The owner of the field switched from rice to broad beans last year as the irrigation source in thenearb y reservoir had dried up. This year he will offer the land to farmers to cultivate vegetablesin greenhou ses.

Elsewhere, the agricultural shift caused by the drought is palpable: dried fishing ponds arebeing converted into vegetable fields, flower market gardens are also being turned over togrowing simple crops.

However, at the top of the county government's agenda is ensuring a water supply for peopleand their livestock, especially in mountainous areas.

"In the mountains, we have to deliver the drinking water in trucks if the rain doesn't come," saidBi Jianwen, deputy director of Songming's water authority.

He added that more than 7,000 residents are facing water shortages in remote villages, whichnormally rely on water stores.

The government has built 763 storage ponds for households in mountainous areas this year.

In the Chuxiong Yi autonomous prefecture, where the drinking water of more than 152,000people is now under threat, authorities said they have devoted more than 220,000 people and31 million yuan to drought-relief, building 530 wells and 187 pump stations.

Experts say that climate change is a factor, as the province received less than normal rainfallduring last year's rainy season and recorded higher temperatures in January and February.

"The amount of rainfall last year is directly related to the drought situation this year and has alot to do with the amount of water preserved in reservoirs and storage ponds," Bi said.

According to Yunnan's meteorological bureau, the average temperature in 104 counties andprefectures is now 2 C higher than in the past.

"The higher temperatures increase evaporation and make it more difficult for reservoirs andponds to retain water," said Li Xie, an engineer on a water conservation project beingcompleted by the water authority in Songming.

In most areas of Yunnan, which lie in tropical and subtropical areas, rain is usuallyconcentrated between July and October and rainfall is scarce during the rest of the year.

Close to 90 percent of the province is mountainous, which increases the difficulty ofconstruction of irrigation and water conservation projects.

Actions inefficient

Zheng Xiaoyun, a water resources researcher at Yunnan Academy of Social Sciences, said thatfour c onsecutive years of drought during spring and winter in Yunnan indicate that seasonaldroughts could become the norm rather than the exception in the future.

However, he said government action currently being taken to deal with the water shortageremains sh ort term and inefficient.

Even though the measures being taken have improved people's water supply,
"the authoritiesare just not paying enough attention to the longer-term drought problems," he said.

Zheng added that the current drought will have far-
reaching effects on the local community,including forcing more workers from rural areas to become migrant workers in other provinces,putting further strains on local authority finances.

"The continuous drought will continue to force the government to devote more resources torelief effo rts, taking money away from other important areas, which will certainly affect the localdevelopment, " he said, insisting the government should develop longer-
term plans, even to theextent of creating special administrations which could manage all the drought-relief efforts.

“Droughts raise water supply concerns”, 07/03/2013, online at: http://www.chinadaily.com.cn/cndy/2013-03/07/content_16286464.htm?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=93cc702e09-RSS_EMAIL_CAMPAIGN&utm_medium=email

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❖ About 60,000 could lose homes for controversial China dams

(Reuters) - China expects 60,000 people to lose their homes in the remote southwest if a series of four dams along the country's last free-flowing river gets the go-ahead, a local official said on Thursday in the first government estimate for relocations.

Outgoing Premier Wen Jiabao, a geologist by trade and populist by instinct, vetoed the dams in Yunnan province on the UNESCO-protected Nu River, known outside China as the Salween, in 2005, after an outcry from environmentalists.

But in late January, the government unexpectedly announced that dam building would resume, with the Nu River high on the list for development.

Qin Guangrong, Yunnan's Communist Party chief, told reporters on the sidelines of China's annual meeting of parliament that work had not yet begun.

But Li Siming, head of the prefecture along the Myanmar border where the dams would be built, said the prefecture had already begun looking at how to relocate people.

"The initial estimate is that 60,000 people will have to be relocated," Li told Reuters. Most are from the ethnic Lisu minority.

"We've not yet got to the stage of working out where they will be relocated to. There are no details yet on whether the projects will even happen," he added. "There are limited amounts of land."

China relocated 1.3 million people during the 17 years it took to complete the massive, $59 billion Three Gorges Dam, built in a much more heavily populated area in central China.

Li, an ethnic Lisu himself, said the environmental impact assessment had not been completed and he did not know when construction might start.

"The whole process, from the central government to the provincial government to the prefectural government, will be open to the public - it's part of the policy of 'letting the light shine on the government'," he said.

Environmentalists have long complained about the lack of transparency about the dam project.

"The problem is that for a matter that has provoked concern from the international community, they have never held a hearing before," Wang Yongchen, an environmentalist who has long campaigned for the Nu River, told Reuters recently.

Li said that most residents supported the dam project, but added that "a minority" did not.

"If we see that development of hydropower resources on the Nu River will not benefit the local people, then we will not do it," he said.

Li sounded uncertain, however, when asked if he personally supported the project.

"I grew up along the Nu River. How to protect it, how to develop it, how to use it, I have my own opinions on that," he said. "I'm a local boy: we've always relied on the land, and the water.

"As head of the prefecture, I'm always thinking about how to protect the land but also how to use it. This is always on my mind... It's not about whether I personally support it or not."

"About 60,000 could lose homes for controversial China dams", 07/03/2013, online at: http://www.reuters.com/article/2013/03/07/us-china-parliament-dam-idUSBRE92608M20130307?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=f015ed3849-RSS_EMAIL_CAMPAIGN&utm_medium=email

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❖ Stalled water-sharing treaty frustrates Bangladesh

DHAKA (AlertNet) - Bangladeshi Foreign minister Dipu Moni is nothing if not optimistic. Asked about the possibility of agreeing with India on the fair distribution of water from the Teesta river, she insists that "We are hopeful of having a balanced treaty for Teesta water sharing between our two friendly countries."

But Moni's upbeat tone is not shared by those who live on the banks of the river in the north of Bangladesh. They say the flow of water from India, where the Teesta originates, is falling, leaving them short of badly needed water for irrigation and affecting rice production.

"The shortages of water are enormous and we are the main sufferers from that," said Oliur Rahman, a farmer from Nilphamari district. "Things are changing rapidly."

Bangladeshi experts claim that India is taking too great a share of the Teesta's flow in an effort to shore up its own water security. The river flows for 315 km (197 miles), 130 km (81 miles) of which are through Bangladesh.

India "built a barrage at Gazaldoba (on the Teesta) and is taking a huge amount of water for their cultivation," said Ainun Nishat, a water expert and vice-chancellor of BRAC University in Dhaka.

The worsening water shortage means the Teesta Irrigation Project, built in Bangladesh in the 1980s, is no longer functioning, said Mohammed Mainuddin, a Bangladeshi hydrologist and research scientist working in Australia.

Lower water flows on the river are "having a serious impact on agricultural production and the livelihoods of millions of people living in the area," he said, and are leading to a build-up of silt in the riverbed, which is decreasing the river's capacity.

"If this continues for long, in the future the river may not exist or may disappear like many others small rivers in Bangladesh," Mainuddin warned. "I think the main and maybe the only cause of water shortages on the Teesta in Bangladesh is the diversion of water upstream in India."

However, changes in rainfall patterns, linked to climate change, may also be reducing the river's overall flow, some experts say.

POLITICAL WOES

Agreeing a deal to share the Teesta's waters equitably is one of Bangladesh's highest priorities in its relations with neighbouring India. A treaty was on the verge of being signed last year during a visit by India's prime minister, but was postponed at the last minute when Mamata Banerjee, chief minister of the Indian state of West Bengal, pulled out.

Because the Teesta flows through West Bengal, the state must give its assent to the treaty before the federal government can present it for signing.

"Mamata denied the deal by saying it's unfair, while Indian critics or columnists are writing (that) Mamata was trying to pressure Indian central government to (provide) more financial assistance for her province," said Amena Mohsin, professor of international relations at the University of Dhaka.

He believes that "Teesta is just a game for her."

While details of the treaty were not officially made public, there was speculation that an agreement had been reached to assign 48 percent of the Teesta's water to Bangladesh and 52 percent to India, but that Banerjee was demanding 75 percent for her country.

Commenting on the treaty deadlock, Nishat, who was an architect of the 1996 Ganges Water Sharing Treaty between Bangladesh and India, said, "Since there is so much politics surrounding it, a political consensus on the issue is essential."

"We set up a treaty for Ganges water-sharing by setting up a goal based on some common ground of interests," observed Nishat. "But this time it's really difficult, especially where a third party (Banerjee) is involved."

Many in Bangladesh feel aggrieved by Banerjee's hardline stance. But Gowher Rizvi, an adviser to Bangladesh Prime Minister Sheikh Hasina, stressed his country's long-term friendship with India and said that both nations were trying to carve out a win-win situation.

"We are not frustrated with our neighbour but both countries are waiting for a mutually beneficial treaty which, I hope, will happen soon," Rizvi said.

However, one foreign ministry official who requested anonymity, was less sanguine.

"Bangladesh is the helpless victim in this wrangling and the Teesta treaty is being used as a bargaining chip," the official said.

"Stalled water-sharing treaty frustrates Bangladesh", 07/07/2013, online at: http://www.trust.org/alertnet/news/stalled-water-sharing-treaty-frustrates-bangladesh/?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=f015ed3849-RSS_EMAIL_CAMPAIGN&utm_medium=email

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❖ Climate Change and Security in South Asia

We have spent a lot of time over the last week focusing on climate change and instability in the Middle East and North Africa. For a change of pace, and geography, here is a quick glimpse of some recent developments in South Asia.

- On February 26, 2013, Pakistan launched its first ever National Climate Change Policy. The next major hurdle for the country is implementing the policy. Some measures will include implementing early warning systems and conducting impact assessments. Managing water, both too much and too little of it, will be a key component to the implementation process.
- For more on regional climate security in South Asia, check out thekeynote address delivered by Larry Brilliant, President of the Skoll Global Threats Fund, to the 2013 Delhi Sustainable Development Summit. The address covers both the broader climate and security dimensions facing the region from melting glaciers, sea level rise and shared water resources, to a poignant look at local level impacts on human security.
- Lastly, on February 8, 2013, the United States-Indonesia Society and the U.S. Embassy in Jakarta hosted a Special Open Forum breakfast and discussion with Admiral Samuel J. Locklear III, the Commander of the U.S. Pacific Command (PACOM), in Jakarta. The discussion focused on Admiral Locklear's perspective on the Asia-Pacific rebalance and included significant references to the security environment in general, and climate risks specifically. We'll have more on this event later, but for now it is worth reading Admiral Locklear's full remarks, "Resilience and the Asia-Pacific Rebalance." His perspective is consistent with some of the main points we made in a previous piece calling on the U.S. to align its Asia-Pacific pivot with investments in climate resilience in the region.

"Climate Change and Security in South Asia", 05/03/2013, online at: http://climateandsecurity.org/2013/03/05/climate-change-and-security-in-south-asia/

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❖ Reducing Dam Impacts and Costs by Thinking of the Land Above the Dam

In the World Bank we often discuss how important it is to integrate solutions across sectors. In Mombasa, Kenya, we have an example of how a comprehensive sediment management approach will allow the government to lower the environmental impact of a proposed dam and save tens of millions of dollars by reducing the amount of sediment that the dam traps. When too much sediment is trapped in a dam, the lifespan of the dam is shortened considerably so reducing sediment is key for long-term success.

The government was considering a design of a dam to provide drinking water to the city of Mombasa and irrigation and drinking water services to people living near the dam site. The proposed dam was planned for 87m high and It was designed to store almost double the mean annual river flow (105 million cubic meters per year). But about 40% of it was dead storage (water that cannot be drained by gravity through the dam's outlets or spillways) needed mainly to store sediment.

The Bank asked a sediment expert to investigate other ways to handle the sediment to see if such a large amount of dead storage was necessary. He gave options for managing sediment in a more comprehensive manner and for operating the reservoir differently. As a long-term measure, watershed management involving soil conservation and catchment restoration can reduce erosion and sediment inflow to the reservoir. Operational options, such as flushing, sluicing, dredging, and hydro suctioning can reduce sediment deposit in the reservoir. In response to the consultant's guidance, the government and their consultants came up with a design that incorporated catchment management, small dams called check dam to catch sediment, and newly-added bottom outlets to allow sluicing and flushing. The new design also included business opportunities for local people to sell the captured sediment as construction materials.

The new design reduced the amount of dead storage needed considerably. Incorporating the catchment and dam operation options into the project gives the same amount of active storage as the original design from a dam 10m lower. The new design has total storage of 119 million cubic meters (60% of the original design). Only 17% of the dam now needs to be allocated to dead storage. Along with this, the consultant team re-evaluated the type of dam, and what was to be a rock-fill dam could

now change to a concrete gravity dam, with a number of advantages: the spillway, which controls the release of flows from a dam, can be incorporated into the concrete dam body, arrangements for flow diversion during construction can be much less complex, local construction materials can be used and the bottom outlets needed for flushing the dam can be added. So overall, that gave the government a smaller dam, smaller area inundated, and the same benefits at lower cost. The figures are still being checked, but current estimates are that these changes have reduced the estimated construction costs by almost 25% or approximately USD 50 million.

"Reducing Dam Impacts and Costs by Thinking of the Land Above the Dam", 05/03/2013, online at: http://blogs.worldbank.org/water/reducing-dam-impacts-and-costs-by-thinking-of-the-land-above-the-dam

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❖ Why Cauvery Stage IV water has reached Bangalore, but not your home

How much of water from the Cauvery Stage IV, Phase II is reaching citizens? Which areas are getting it? If your area is supposed to be covered and you are still not getting water, here's why.

Residents of Sobha Daffodil apartment in HSR Layout Extension have been waiting for water for the last 4-5 months. They had paid around Rs 10 lakh to the BWSSB for water from Cauvery Stage IV Phase II project; they got pipelines laid and meters fixed. But no water comes here yet.

"We paid a few crores some 3-4 years back too, for water. In the last few months, we went to the local BWSSB office some 10 times. Every time, we were told that water will come the next day or next week, but there has been no supply," says a member of the apartment owner association here, on condition of anonymity.

Cauvery Stage IV project was supposed to have met the water needs of CMC areas in the city. About 500 MLD (Million Litres per Day) was supposed to come, but not even half of this is reaching the city now. BWSSB says that only 220 MLD is coming from the scheme. The project was commissioned on October 31st last year.

Why the delay

There are two main reasons for the delay - one that many people are not taking new Cauvery connections yet, and two, that the Board has not completed pipe laying in all areas yet. Because of this, a large number of people who have already paid for the new connections, are still water-starved.

Stage IV water is supposed to be for the 7 CMCs and Kengeri TMC which were added to the city corporation limits in 2007. There were 110 villages also that were added to BBMP at the time; these villages are not supposed to get the new water.

BWSSB has nine divisions in Bangalore, of which north, north west and east divisions are getting the highest amounts of Stage IV water. Overall, there are some 43,600 new connections in the city that are getting Stage IV water. Some of the new water goes to old connections too, augmenting existing supply.

Here are areas that get Stage IV water now and the amounts they get, by division:

North	**40 MLD**	Parts of Yelahanka, to Jakkur and Thanisandra in Byatarayanapura constituency, and to four wards in Dasarahalli constituency (Shettihalli, Mallasandra, Bagalkunte and T Dasarahalli).
North west	**60 MLD**	Dasarahalli constituency, Peenya, parts of Yelahanka, Rajagopala Nagara, part of Hegganahalli, Chokkasandra, HMT ward and T Dasarahalli.
West	**8 MLD**	Rajarajeshwari Nagar, Kengeri, Ullal, Annapoornashari Nagar, Papreddy Palya, Mallathahalli, Kengunte, Jagajyothi Layout, Jnanbharathi Layout, Ideal Homes, BEML Layout 3rd 4th and 5th stages, Pattanagare, Channasandra etc.
South	**10-15 MLD**	Kothnur Dinne which includes JP Nagar 6th, 7th and 8th phases, Vijaya Bank Layout and Bommanahalli.
South East	**25 MLD**	Core areas like Indiranagar, Jeevan Bheema Nagar, Domlur, Ulsoor, Thippasandra, HAL, LIC Colony, Lakshmipura etc., which have already been getting water. Existing supply is only augmented with the new water.
Central		Does not get any water from Stage IV. But once OMBR reservoir gets stage 4 supply completely, its Stage III water will be diverted to central division. This will come to 20 MLD
North East	**6 MLD**	This division also has core areas that already get water. New water augments supply in Bhoopasandra and Nagashettihalli areas.
South West		No water from Stage IV as these are core areas. Water will get diverted here only if there is excess after all CMC areas get water.
East	**40 MLD**	Water goes to KR Puram constituency, Mahadevpura constituency and Sarvagna Nagar constituency

"Public has to take connections first"

In CMCs, pipelines were laid in many areas in 2005 as part of GBWASP (Greater Bangalore Water and Sanitation Project). The lines were laid, but no supply was given at the time. When people in these areas take connections, water will be released to them through these pipelines. Since road alignments had changed much and muck had clogged the pipes, much time was spent in doing trial runs to de-clog pipes and to repair damaged ones.

BWSSB Chief Engineer T Venkatraju says that, now if everyone does not take connections, water cannot be supplied even to those who have taken them. This is because the ends of these pipelines are

left open near individual houses, as there are no valves to stop the flow and water will spill out if connections are not taken to the houses. Of the 1.4 lakh households that were given GBWASP connections, only 40,000-50,000 had taken connections, as of January end.

On why this was done, Venkatraju says, "Many of these roads are only 3m wide, and hence valves could not be fixed along the roads, when the pipes were first laid. Roads are now getting flooded when water is released." Valves will be fixed for individual houses only when they take a connection. So unless everyone takes a connection, water will spill out through the open-ended lines.

He says that this is the case in Devasandra, which is at the tail end of the water supply system in KR Puram constituency. "For water to reach there, the people along the way, such as in Ramamurthy Nagar, have to take connections. Some 30,000-40,000 house connections were given in KR Puram constituency under GBWASP. But only 1000-2000 have applied for new connections."

Venkatraju says that out of the one lakh houses in the constituency, only about 10,000 are getting water from Stage IV now. Similarly, he says that, in HSR Layout only 25% of people have applied for new connections.

Experts lament this strange logic. "Mind bogglingly stupid" is how city-based water expert S Vishwanath describes laying of open-ended lines in the GBWASP project. "Now at least, BWSSB should give free connections to everyone and start charging them for monthly water consumption, instead of waiting for public to take connections. This was done successfully in places like Vijayawada earlier," he says.

Vishwanath also says that BWSSB should have used the loop system of pipes, instead of the current tree-and-branch system. In the loop system, the supply lines are set up in a closed system and there are no open ends. Water is equally distributed to every point; but in the tree system, "water pressure becomes very low as it comes to the last point," he says.

N S Mukunda of Abhyudaya, a South Bangalore-based RWA federation, says that the case of open-ended pipes show BWSSB's severe technical incompetence. "It is not difficult to plug the end of lines, or to put valves to regulate supply to groups of houses. The GBWASP project itself was a sham - public were asked to pay for connections even without BWSSB committing to give water."

While Venkatraju says that the Board has more than enough water and is only waiting for public to take connections, Mukunda says that BWSSB is only giving excuses. He says that the basic necessities - enough water, reservoirs/tanks with good storage capacity, and proper distribution system - do not exist. "About 45% of the water goes in leaks," he says. The data given by BWSSB shows that, currently about 50% of water is unaccounted for.

In the month of January, BWSSB has accounted for only 6.6 lakh connections while at least 16 lakh properties are estimated to be in BBMP limits. By conservative estimates, some 33,000 Million Litres come to the city every month from Cauvery, but in January, BWSSB has accounted for only about 16,785 Million Litres. The other half of the water was lost because of leakages and illegal connections.

A BWSSB engineer says, on condition of anonymity, that unaccounted water is higher than usual now, as more water is lost due to testing and trial runs for Cauvery Stage IV.

Why are residents not applying for Cauvery connections?

Venkatraju says that people in CMC areas are not taking connections as they have been getting water from BWSSB tankers already. BWSSB says they supply borewell water to households in CMC areas for Rs 50 per month.

BWSSB has been disconnecting GBWASP house pipelines of those who are not taking new connections. This has been going on for a while, but is not being done in a large scale as it is also a difficult job; the intention is to get people to apply soon. Once the line is disconnected, the house owner will have to get the connection laid again at his own cost, after taking road cutting permission from BBMP.

Areas like JP Nagar 8th phase had not been covered under GBWASP, and most are not applying for new lines to be laid. G Jagadish, President of Federation of JP Nagar 7th and 8th phases, says, "Most people in 8th phase have individual borewells; there are also community borewells. So, many of them don't want to spend more on new connections. In the long run, everyone has to get connections as borewell water levels are depleting, and as there are restrictions on digging new borewells now."

Jagadish says that main lines already exist here and that only individual connections have to be taken. People here are also dissuaded on seeing that those in 7th phase, who get Stage IV supply, get water

only once a week, that too for 2-3 hours. "BWSSB officers told us that water is being rationed now as summer is coming," says Jagadish.

Some areas are not getting water also because BWSSB is yet to complete about 25% of its pipe laying works. GBWASP lines have not been fully linked with the feeder lines coming from reservoirs. This is the case in Central Jail Reservoir, which is actually supposed to supply 43 MLD to areas nearby.

As lines are not laid, no water is being supplied from here now. "This area is already getting water from Cauvery Phase 1, hence priority is low here. It is also among the outer villages that form BBMP (beyond CMC), which are anyway not supposed to be covered in Stage IV," says Narayan, Chief Engineer (Cauvery).⊕

"Why Cauvery Stage IV water has reached Bangalore, but not your home", 07/03/2013, online at: http://bangalore.citizenmatters.in/articles/view/4988-why-stage-iv-cauvery-water-has-reached-bangalore-but-not-your-home

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❖ Joel Brinkley: Dam construction raising regional tensions

Here come those dastardly dams!

In Asia, Africa and the Middle East, nations are aggressively building new hydroelectric dams, seemingly heedless of the potentially disastrous effects on the countries downstream.

As examples, Laos broke ground on a new Mekong River dam that's causing concern bordering on fury in Cambodia and Vietnam. India is enraged about a new Chinese dam going up on the Brahmaputra River. And Ethiopia's new dam on the Nile is angering Sudan, while Egypt has threatened war.

What's behind all this consternation — and worse? The concerns are multifaceted. In a broad sense, though, the rivers have provided sustenance for millions of people for millennia, and dams threaten that. Because of this, in some places multinational commissions were set up decades ago to arbitrate disputes like these. One is the Mekong River Commission, which pledges to "place regional cooperation and basin-wide planning at the heart of our operation."

Well, that's not working.

The larger problem is, as climate change advances and growing populations demand more water and power, many upstream nations are ignoring their responsibilities to their downstream neighbors — and the guidelines of commissions they helped establish.

Perhaps the most egregious example is Laos, which broke ground on a new hydroelectric dam on the Mekong late last year — ignoring the howls of complaint from downstream. Just south in Cambodia, for example, the Mekong provides the livelihood for much of the population because of an unusual natural phenomenon.

Cambodia's Tonle Sap River is a Mekong tributary that flows southeast from a lake of the same name. Each spring, the Mekong swells, and its current grows so strong that it forces the Tonle Sap River to reverse course, carrying tons of rich, fertile mud and millions of young fish back up to the lake. The lake floods, depositing new, rich soil on thousands of acres around its perimeter. The fish

provide meals for Cambodians through the year. By potentially restricting the river's flow, the Laotian dam threatens all of that.

But it gets even worse. Breaking ground, Laotian officials said they hoped the new dam would help vault their nation from its status as one of the world's poorest. Many Lao have never even seen a light bulb. But in fact, a short time later the government signed a contract to sell most, if not all, of the electricity to Thailand. And Laos' unaccountable, corrupt leaders will almost certainly pocket the proceeds.

Still, Laos is subject to a perverse form of dam justice. Now, all of a sudden, those same leaders are quite angry about still another dam China is building on the Mekong just north of the Laotian border.

Just recently, China made public its plans to build more than 60 new hydroelectric dams in the next few years, potentially setting off multiple disputes. One is already under construction on the Yarlung Tsangpo River, which originates in Tibet and flows south to Bangladesh and India, where it's called the Brahmaputra.

China's dam "will prove disastrous to the downstream regions of the northeast," declared Rajnath Singh, a prominent Indian politician. But China is unrepentant.

In the Middle East, Egypt has asserted full control over the Nile River since 1929, when the British colonial government prepared a "treaty" reserving 80 percent of the Nile's water for Egypt and Sudan. Ever since, Egypt has insisted that the treaty's provisions are still relevant and threatened to attack neighbors who dared breach it. After all, for all of time Egyptians have lived off the river, catching fish and using river silt as crop nutrients.

Right now, however, Egypt is locked in foment over the Muslim Brotherhood's faltering attempts at governance, and its upstream neighbors don't seem to fear it any longer. So Ethiopia is now building what it calls the Grand Renaissance Dam, a $4.8 billion hydroelectric behemoth.

Ethiopia plans to create a vast reservoir behind the dam to assure a constant flow of water. But hydrologists say it could take five years to fill, "drastically affecting agriculture, electricity and water supply downstream," Haydar Yousif, a Sudanese hydrologist, told Middle East Magazine last month.

What's more, he added, 3 billion cubic meters of water will evaporate from the dam's reservoir each year.

Late last year, WikiLeaks made public a memo in which the Egyptian government threatened to deploy fighter-bombers to destroy Ethiopia's dam. The government protested that the memo was written in 2010, before the revolution, and was not relevant now.

But if the Nile begins drying up because of that dastardly dam, Egypt may change its mind.

"Joel Brinkley: Dam construction raising regional tensions", 09/03/2013, online at: http://staugustine.com/opinions/2013-03-08/joel-brinkley-dam-construction-raising-regional-tensions#.UTtC_9bwmz4

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❖ More than water play

Water policy instruments based on evidence-based and environmentally sound economic measures should replace financial instruments merely designed to recoup water costs

Jaroslav Mysiak is a senior researcher in environmental economics at the Fondazione Eni Erico Mattei and the Euro-Mediterranean Center for Climate Change, both in Venice, Italy. As the co-ordinator of the EPI-WATER project, he is talking to youris.com about assessing effectiveness and efficiency of economic policy instruments to assist in meeting EU water policy goals of increasing environmental protection of water resources.

What is the main goal of the project?

EPI-WATER aims at collecting empirical evidence about how economic policy instruments (EPIs) perform in practice. Examples of such policy instruments range from water charges to specific environmental taxes or subsidies and compensation mechanisms. Our goal is to design innovative economic instruments better able to deliver on environmental challenges than the regulation alone. This approach will be tested on a representative set of river basins across Europe, following water use through all types of users, individual, industrial and agricultural. If we could demonstrate how this can be done by providing solid evidence, the water authorities might be much more willing to change the way they work.

What is the difference between financial and economic policy instruments?

Let me answer with an example. If your water consumption is not metered, and the cost of water supply is simply split among the customers, the water charge serves primary to recover water costs. In other words, it serves as a financial instrument. Instead, if you are paying only for water you have consumed, and you can see the difference on your bill, then you are likely to use water more efficiently as the price increases with usage. In this case, water charge is an economic instrument. The more so if the revenue collected is invested in providing better services and improved environmental protection.

What do we know about the effectiveness of water policy to date?

In the first phase, the project conducted a horizontal review of some thirty water policy instruments such as water tariffs, pollution charges, taxes, and water trading, implemented in Europe and elsewhere. We found little commitment to evidence-based decision making. Furthermore, we also

found that the existing economic instruments have often not been designed to enhance environmental protection but are mere financial instruments used to raise revenues and cover water costs.

Far too often, the environmental and societal potential of economic instruments is not fully realised. For example, the water framework Directive makes the recovery of costs of water services compulsory. But there is no shared view on the definition of a water service. Some Member States have adopted a very narrow interpretation of the term 'service'. The European Commission is pursuing legal actions in these cases.

How does this kind of economic policy instruments work? Are they just awarding the investments in infrastructures for a greener water system?

Infrastructure is not the only precondition. Let me use another example. Let's assume a producer requires a large volume of water but that creates low economic value. He might be willing to transfer part of his water entitlements to another user, as long as he is compensated for his loss of revenue in terms of opportunity cost. This way the other users purchasing the water credit, such as for example a water utility supplying with water a middle-sized town, is able to postpone their investments in larger water infrastructure, say, to get prepared for a drought. Hence the transaction is a win-win situation for all. The EPI-WATER explores similar ways of making water management and use more efficient through a variety of instruments such as trading of water entitlement.

"More than water play", 08/03/2013, online at: http://phys.org/wire-news/124208560/more-than-water-play.html

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❖ Arison's Miya to expand water projects globally

(Reuters) - Miya, the water company set up by Israeli billionaire Shari Arison, will continue to expand into Latin America, Europe and Asia this year to meet rising demand for drinkable water.

Arison said Miya was already doing projects in the Bahamas, Manila and inBrazil.

"Most urban water systems lose a huge amount of water and we have come up with the way of using efficient management that reduces that lossage, which creates more water for people," Arison told Reuters on the sidelines of a philanthropic event known as Good Deeds Day.

She noted that Miya has had requests for projects in Europe and in Puerto Rico.

Arison, with a net worth of $4.2 billion, is No. 308 on Forbes' billionaires list and is the fourth richest person in Israel.

Through her investment arm Arison Holdings, she is the controlling shareholder of Bank Hapoalim, Israel's largest bank. Arison also controls Shikun & Binui, Israel's top construction group.

Her brother, Micky Arison, is chief executive of cruise line Carnival Corp.

Arison said she was interested in further investments for Shikun & Binui in solar energy.

"Anything that's good for the environment, that's where we want to be," Arison said.

Arison launched Good Deeds Day in Israel seven years ago and on Tuesday visited various projects such as building a garden and improving an Arab school in Lod.

"We have forgotten simple human values and it's really to remind people that anyone can do a good deed," she said. (Reporting by Steven Scheer)

"Arison's Miya to expand water projects globally", 05/03/2013, online at:
http://www.reuters.com/article/2013/03/05/arison-miya-idUSL6N0BXGJH20130305

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