

ORSAM WATER BULLETIN

Weekly Bulletin by ORSAM Water Research Programme

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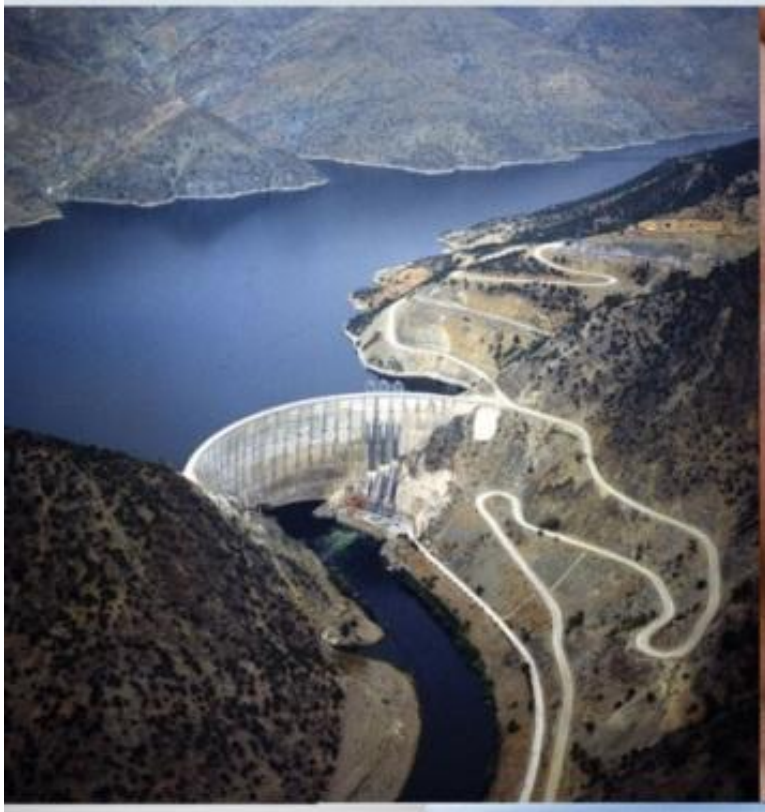



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❖ Concerns Over Blocking of Alwand River By Iran

KAHANQIN, Iraqi Kurdistan – Kurdish farmers in the Khanain region are concerned that the Iranian authorities may block the Alwand River which originates in the country's western front and flows into Iraq's Diyala province.

Kurdish and Arab farmers in the province complain that their farms and animals are affected by a drought because the river is no longer flowing into their area.

Sardar Ahmed, the district administrator of Khanaqin, said by the blocking of the river, "Fifty percent of the remaining farms and orchards will perish."

According to Ahmed, dozens of villages and towns near Khanaqin rely on the Alwand River for drinking water and agriculture.

Ahmed is concerned about the farming season when the lack of water will inflict greater damage on the region's farms.

He said the damage "will be even greater if they (Iranians) do this again at the peak of summer."

According to Khanaqin Directorate of Agriculture, 63 kilometers of the 152-kilometer-long Alwand River passes through Iraqi Kurdistan.

The directorate reports that around 1,000 acres of fruit trees and 48,000 acres of farmlands depend on the Alwand river.

"My orchard has never been like this before," said Hassan Salim, a Khanaqin farmer. "Last year my date palms, orange, pomegranate, mandarin, and olive trees produced only 700 kilograms of fruits. Normally they produce 70 tons. If it happens again and Iran decides to block the water, then I have no choice but to abandon my orchard. What can I do without water?"

Four years ago, orchards and farms in northern Diyala were among the most productive lands in all of Iraq. But now thousands of farmers are deeply worried about a possible Iranian project to build a dam on the Alwand River across the border.

Kamaran Abdullah, head of Khanaqin Agricultural directorate, said that around 90 percent of farmers in the area are Kurds and 50 percent of their trees have perished.

Abdullah said the only alternative to rescue the farms is to dig water wells, but he doesn't believe it's a viable solution.

"These orchards are too big to be watered with water wells," he said.

Iranian authorities blocked the river last summer, alarming the region's farmers. Former Kurdish Prime Minister Nechirvan Barzani visited Iran in August to discuss border issues with Iran, among them the Alwand River.

Hasaan Jihad, a Khanaqin official. was part of the Kurdish delegation that visited Iran.

"I took two photos of the Alwand River with me to Iran," Jihad said. "One of Alwand before the water was blocked and one after. We showed them (the Iranians) the photos and explained the damages caused by blocking the river."

According to Jihad, there are now plans to build a dam named Shahin on the river.

Jihad said, "Iraq's foreign minister has called the Iranian ambassador and discussed this matter with him. Agricultural committees from Iraq and Iran have also decided to meet in February, but this is no guarantee that Iran won't block the Alwand River again next year."

To find a sustainable solution for water shortage in the area, the Iraqi government has started building a dam on the Alwand River about 10 kilometers south of Khanain.

Samir Muhammad Nuri, the head of Khanaqin's city council, said, "Next May, this dam will be completed. It can hold 38 million cubic meters of water and will solve 80 percent of our water (shortage) issues in the summertime."

Nuri believes that the Kurdistan Regional Government (KRG) should connect the Sirwan River with the Alwand—a river that also flows from Iran into Iraqi Kurdistan near Halabja—which would help solve Khanaqin water shortages.

The fruits of the Khanaqin area high quality.

According to Abdullah, the area produces nearly 4,000 tons of orange, pomegranates and dates every year. However, last year they produced just 1,500 tons.

Abdullah said the water shortage may force farmers to sell their land for housing projects.

"If the water continues to be blocked, it will totally destroy the orchards and the farmers will end up selling their farms and orchards to housing projects," Abdullah said. "So we're giving new plants to farmers to replanting their lands instead of selling it."

"Concerns Over Blocking of Alwand River By Iran", 06/12/2011, online at:
http://www.rudaw.net/english/kurds/4205.html

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❖ Turkey's bid to restore balance

Despite the historic animosity between the two neighbours, the recent shift in Ankara's Syria policy is due to geo-political factors

Since they emerged as new states after the collapse of the Ottoman Empire following the First World War, relations between Syria and Turkey were marked by animosity. The history of Syria and Turkey would reveal that most of these relations have contributed to their physical insecurity with regard to each other, and their persistent endeavours to achieve their security requirements.

Border dispute was perhaps the thorniest issue. Both Syria and Turkey claim unquestionable sovereignty over Uskandaron province (Turkey calls it Hatay) which came under Turkish control in 1938. Dispute over water distribution — the problem of the Euphrates, Orontes and Tigris rivers — had also hindered the establishment of good relations between the two countries. This is especially an important issue wherein both sides try to meet their developmental requirements.

Furthermore, since the early 1980s, Turkey used to accuse Syria of providing the separatists Kurdistan Workers Party (Partiya Karkerana Kurdistan, or PKK) with weapons and logistic support to gain concessions on other fronts. Syria accused Turkey, on the other hand, of supporting the Muslim Brotherhood during and after the Hama massacre in 1982.

Given the complex nature of these relations, the end of the Cold War did not lead to fundamental shift in the way the two neighbours viewed each other. It was the US invasion of Iraq in 2003, however, that resulted in notable change in the foreign policies of Damascus and Ankara. Facing different set of challenges, Syria and Turkey opted for co-operation to help restore the regional balance of power, which has been disrupted by the occupation of Iraq. Common geo-political interests made most, if not all, of the historic differences between Turkey and Syria irrelevant.

"Turkey's bid to restore balance", 09/12/2011, online at: http://gulfnews.com/opinions/columnists/turkey-s-bid-to-restore-balance-1.947514

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❖ Deputy: Iraq suffers heavy economic losses due to lack of water. An expanded conference was held in Baghdad soon

Baghdad (News). Revealed a member of the Committee on Agriculture and Water parliamentary blame al Douri great preparations carried out by the authorities concerned to hold a conference in Baghdad on water scarcity in Iraq, indicating that Iraq suffers heavy economic losses as a result of this drought.

Al Douri said correspondent (news agency News) Wednesday: that the committee determined to be involved in any negotiations in the water with Turkey or Syria اوايران, stating that Iraq's share of water والدستات is not enough and the attention to this important issue because this scarce Iraq suffered heavy economic losses may be very in the years to come.

Al Douri said: that the land of the two rivers has been suffering from water scarcity because of the policies of neighboring countries to Iraq, where Turkey built dams and Iran close rivers, said: the fact that the executive bodies prepares for an extensive conference on حشه water, but did not mention the details.

The league called on the Iraqi government to deal with the ideals with those states that are seeking to shut down the river, and Iraq has treated trade with Turkey and Iran and to press for the water.

They pointed out that there is a big preparations undertaken by the on water and agriculture and water to hold parliamentary ؤمتمركبي in Baghdad on water scarcity in Iraq."

It is worth mentioning that the conference to be held in Baghdad on scarcity of water rights be devoted to Iraq in the maintenance of water rights. /End/12. For.)

"Deputy: Iraq suffers heavy economic losses due to lack of water. An expanded conference was held in Baghdad soon", 07/12/2011, online at: http://dinarvets.com/forums/index.php?/topic/94266-deputy-iraq-suffers-heavy-economic-losses-due-to-lack-of-water-an-expanded-conference-was-held-in-baghdad-soon/

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❖ Iraq's Water Resources Lalonde Implement Dam Project in Diyala Cost (30.5) billion

Erbil, December 4 (Rn) - The Ministry of Water Resources of Iraq said on Sunday that technical and engineering staff in the General Authority for dams, reservoirs and company Rivers General for the implementation of dams within the formations and the Ministry of Water Resources, the implementation of the dam project Lalonde, which is located on the River Lalonde (7 km) south of east of the town of Khanaqin, (6 km) from the Iraqi-Iranian border, at a cost (30.5) billion Iraqi dinars.

The statement issued by the Ministry, which received the news agency Kurdistan (Rn) a copy of it today that "the project aims to store rain water and floods and their use in irrigating the agricultural lands in the season of water scarcity (summer) and to prevent the risk of flooding to areas located in the back of the dam, and to increase the water table, and the use of water for drinking purposes and livestock, as well as take advantage of the lake water to mitigate the environmental atmosphere and make the region a tourist resort. "

The project consists of four main sections, first the body of the dam, a kind of dirt with a core of mud, and established the second is the liquid water which is the origin of a concrete discharging flood water and excess water from the lake in order to Trgiaha to the River Lalonde on the back of the dam through the channel of tankers along the 1600 m "..

The statement said that "the third part which is the origin of a concrete tubular mission to pass the water through iron pipes pass through the body of the dam and encapsulated by concrete armed, and controlled discharge by closing the mechanical, and established the fourth port is lower, which is an origin of the concrete with tubes Hdeden going through the its mission through the body of the dam and lake water drainage for the rapid discharge in cases of maintenance or in case of emergency. "

"Iraq's Water Resources Lalonde Implement Dam Project in Diyala Cost (30.5) billion", 04/12/2011, online at: **http://www.dinarrumor.com/showthread.php?31807-Iraq-s-water-resources-Lalonde-implement-dam-project-in-Diyala-cost-(30.5)-billion**

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❖ Mideast Water Shortages Threaten Millions

At Cairo's posh Gazeera Club, workers leave the showers running as they sit nearby drinking tea and chatting. Large quantities of water pour down the drain as water pipes around the city and its suburbs run dry.

For inhabitants of Cairo's poor neighborhoods, water only infrequently arrives via government pipes. In order to cook and stay hydrated, says resident Hossam Abdel Razaq, housewives trek to a local water dealer and buy the precious liquid for 25 cents. When water does briefly flow, he adds, kids run to the faucets to drink.

A regional problem

Due to increasing populations, climate change, poor infrastructure and inefficient use of resources, serious water shortages are threatening the lives and livelihoods of millions of people across the Middle East.

In Egypt, government statistics indicate the country uses 55 billion cubic meters of water per year, 87 percent of which comes from the River Nile. But conflict with neighboring states upriver, however, is creating tension and could exacerbate the crisis.

Governments in Ethiopia, Kenya, Uganda and Southern Sudan argue that they should get a larger share of the Nile's waters, but Egypt and Sudan insist that a British colonial agreement gives them the right to use most of the Nile's waters.

Omar Ashour, who teaches political science at the University of Exeter in Britain, says Egypt is paying a price for years of benign neglect of southern neighbors.

"What we're harvesting now is decades of bad foreign policy when it comes to the central African and southern neighbors," he says. "During Mubarak's time there was the complete ignoring of development projects, of cooperation, and there was this superiority-inferiority complex reflected in foreign policy towards neighbors in the south, especially Ethiopia, Rwanda, southern Sudan and Sudan. There was this assumption that they were allies and friends during [President Gamal Abdel] Nasser's time and that [would] remain the situation regardless of how Egypt treated them."

Although Ashour notes that youth leaders of the January revolution met with presidents of both Ethiopia and Uganda in a goodwill gesture to repair strained ties, water, he stresses, remains "pretty much one of the most sensitive national security and foreign policy issues for Egypt."

The first major city to go dry?

Across the Red Sea in war-torn Yemen, residents of the capital Sana'a say government water comes to their houses "so infrequently" they are "forced to pay to haul it in from outside the city by truck."

United Nations Development Program statistics also indicate that levels of Yemen's 21 main aquifers are falling by seven meters per year on average, leading some experts to speculate the country will be

completely out of potable water within five to 10 years.

Hakim Almasmari, Editor in Chief of the *Yemen Post*, says "less than 10% of the country gets its water from the government" and that "Sana'a could be the first capital in the world to run out of water." He blames poor infrastructure and the culture of Yemen's ubiquitous narcotic qat tree for the problem.

"First of all, there's no real infrastructure that can help in using the rain-water appropriately, and so everything that is being used in Yemen is the underground water," he says. "Seventy percent of that water goes to qat plantations, and Yemenis seem to be growing it more and more every day."

To the north in Lebanon and Syria, where it rains more frequently, poor infrastructure prevents capture of considerable quantities of rainwater, which ends up in the sea. Professor Louis Hobeika, who teaches economics at Lebanon's Notre Dame University, also points out that water is priced inexpensively, which encourages people to squander it.

"People abuse the consumption of water because the price is low, and there is no metering system," he says. "For example, in Lebanon we don't have meters in the use of water. We pay an annual fee and it's independent of how much water you consume, which is frankly ridiculous. It pushes people to over-consume and to waste it."

An exacerbating factor

Although Lebanon and Israel have a history of quarreling over water from southern Lebanon's Litani River, Hobeika stresses that bad political relations between most countries in the region tend to exacerbate the crisis wherever it persists.

"Economic and political relationships among countries in the Middle East is usually bad and, therefore, water is one of the sources of conflict in the region," he says. "The water of the Litani River in Lebanon is one of those important examples of current and especially potential conflicts between us and Israel."

"Mideast Water Shortages Threaten Millions", 09/12/2011, online at: http://www.voanews.com/english/news/middle-east/Mideast-Water-Shortages-Threaten-Millions-135335598.html

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❖ Zombie Water Projects (Just when you thought they were really dead...)

Zombies are big business, in more ways than one. Zombie books, movies, costumes, make-up, computer games, and more are probably worth billions to our economy, not to mention the value of extra sales of axes, chainsaws, and shotguns to people who never hunt or cut down trees.

But not all zombies are fictional, and some are potentially really dangerous – at least to our pocketbooks and environment. These include zombie water projects: large, costly water projects that are proposed, killed for one reason or another, and are brought back to life, even if the project itself is socially, politically, economically, and environmentally unjustified. Here are four kinds of zombie water projects that have been repeatedly beaten down for a variety of reasons but that keep rearing their ugly heads. Keep those chainsaws lubed and fueled:

1. Water transfers from the Great Lakes or the Mississippi River or Alaska and Canada to the arid southwestern U.S.

These are perennial favorites: people look at the vast amount of water in the Great Lakes, or flowing down the Mississippi River, or flowing north to the Arctic Ocean and think, gee, what could make more sense than to take that water and move it to where we really need it, like California or Arizona or Las Vegas. After all, we've been moving water around since the beautifully designed Roman aqueducts, and even earlier. But most of these mega-projects are zombies – killed off years ago, only to linger, undead.

Patricia Mulroy, who runs the Southern Nevada Water Authority, recently revived the idea of moving floodwaters from the Mississippi River all the way to Colorado, New Mexico, and Arizona to free up Colorado River water that could then be given to feed Las Vegas. Fear that similar projects would take water out of the Great Lakes led to a provision in the new international agreement signed by the U.S. and Canada that effectively prohibits transfers of water out of the basin because of fear that such diversions would lower the Great Lakes levels and threaten the health of fragile natural ecosystems. And of course there is the granddaddy of all water diversion proposals – called NAWAPA (the North American Water and Power Alliance) – proposed in the late 1950s and early 1960s by a consulting/construction company to divert around 150 million acre-feet of water annually (ten times the flow of the Colorado River) from the Yukon, Copper, Kootenay, Fraser, Peace, and other Alaskan/Canadian rivers all the way east to the Great Lakes and south to the southwestern U.S. and even Mexico. And a smaller version of this zombie is the Million Conservation Research Group proposal (named after Aaron Million – if it had anything to do with the cost, it would be the Billion Conservation Research Group) to build a pipeline from Wyoming to eastern Colorado to take 250,000 acre-feet of public water to sell for private gain. Professor Robert Glennon from the University of Arizona quipped that he sees many obstacles to the project, "not the least of which is the Rocky Mountains."

These mega-projects are certainly **technically feasible**: there's no mystery to building dams, aqueducts, pumping plants, and pipelines. What kills these projects is their massive political, environmental, and economic cost. They would cost tens or even hundreds of billions of dollars and lead to vast environmental destruction and devastation. Half a century ago, we didn't know about the ecological consequences of massive water diversions, or we didn't care, but those days are over. On

top of this, any such project would require unprecedented political and legal water sharing agreements and anyone who believes such agreements can be reached is living in a fantasyland. But that doesn't stop these zombies from periodically coming back to life.

2. Water transfers from Alaska or Norway or the Arctic/Antarctic to Asia or the Middle East through the ocean

An international version of the major pipeline or aqueduct projects described above is the idea of putting water in tankers or big plastic bags and shipping it overseas (or, the earliest version – towing icebergs). The most recent example is the proposal to ship water from Sitka, Alaska to Asia or even the Middle East. Once again, a logical idea runs smack into the wall of economics, though for some reason, these water entrepreneurs seem blind to economics. In this case, the proposed price is around $0.01 per gallon. The water would be put into tankers or water bags and shipped overseas. [I don't believe that they can actually ship water from Alaska to the Middle East, or even closer, to Asia, for $0.01 per gallon, but let's assume, for the moment, that they can.] Let's do a simple back-of-the-envelope calculation that seems to be beyond the ken of those pushing the project: $0.01 per gallon is equal to $2.64 per cubic meter. The current price of coastal desalination, which produces highly pure water, varies from place to place, but is already well below $2 per cubic meter. Why would any buyer agree to buy more expensive water, of no better quality, from someone else when they could build a desalination plant under their own control? So far, none have. But expect to see this zombie staggering around periodically.

3. The Poseidon Carlsbad desalination project

Having just argued that desalination makes more sense than water transfers through the ocean from water-rich to water-poor regions, it turns out that not **all** desalination plants make sense. It is a proven technology – thousands of desalination plants are operating around the world – but it is a costly one to do properly. An effort by a private development group, Poseidon Resources, to build a plant at Carlsbad, near San Diego, has become the textbook case of how NOT to build a desalination plant (ironically replacing the previous textbook case of how not to build a desalination plant – Poseidon's earlier venture with the Tampa Bay desalination plant in Florida). The Carlsbad plant was originally projected to cost around $270 million. A year ago, the costs had risen so much that Poseidon was trying to get $530 million in tax-free bonds to help them finance the project, on top of a massive subsidy from local water agencies. A month ago, they filed a new application for $780 million in tax exempt bonds, suggesting the cost is approaching a billion dollars. The company's current estimate is that the cost of delivered desalination water has skyrocketed over the past few years to around $2000 per acre-foot, which is nearly triple San Diego's current supply costs. And their design is still controversial because of concerns about location, environmental impacts, and financing. Moreover, the complete lack of transparency about contracts, permit decisions by local governments, Poseidon financial structure and funders, and the true economics of the plant have soured even strong proponents of desalination. This zombie refuses to die only because outside investors (either unbelievably gullible or incredibly smart) keep putting in money.

4. The Cadiz groundwater mining project

Another effort to turn a public water resource into a private good is the Cadiz Valley Water Conservation, Recovery and Storage Project (or the Cadiz groundwater mining project). This project is the brainchild of another private investment group and hopes to mine groundwater from an aquifer located in the eastern Mojave Desert in San Bernardino County. This project is unsustainable: it takes more groundwater out than nature recharges. Over time, this will result in disappearance of surface springs and ephemeral water in desert lake beds, and a declining groundwater level. In other words, the project exchanges public goods for private gain. An earlier version of the project, not much different from the current one, was killed by the Metropolitan Water District of Southern California because of environmental and economic concerns, but like a water zombie, Cadiz has come back to life. A new draft Environmental Impact Statement has just been released, but beware: it is 305 megabytes in size, which makes it pretty much impossible for normal citizens to download it and read it to find out if it needs to be tackled with an axe or a chainsaw.

There are many smart water investments to be made, in industrial and agricultural water-efficiency technologies, better wastewater treatment plants capable of producing the highest quality waters, improved piping and distribution systems, lower energy desalination systems, improved monitoring tools, low-water-using crop types, and much more. But wasting precious time and scarce money on water zombies will not lead to a sustainable water future.

"Zombie Water Projects (Just when you thought they were really dead...)", Peter Gleick, 07/12/2011, online at: http://www.forbes.com/sites/petergleick/2011/12/07/zombie-water-projects-just-when-you-thought-they-were-really-dead/

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❖ Water Authority finds high levels of pollution near former munitions plant

Authority finds pollution caused by organic materials and explosives, detecting traces of the highly poisonous RDX compound, used in the production of explosives, at a level three times higher than legally allowed.

Environmentalists are concerned that past military industrial activity near Be'er Tuvia has left ground and water in the area polluted. The Israel Water Authority recently identified high levels of pollution, along with explosive remains, at the Ram industrial park, north of Kiryat Malakhi. In past years, several sources of pollution emanating from IDF bases and defense-related plants have been detected.
Last week, the Water Authority notified government ministry officials and the Mekorot water utility that it had taken underground water samples from an area 650 meters west of the Ram industrial park, within the Be'er Tuvia regional council.

Israel Water Authority

The entrance to the former munitions plant near Be'er Tuvia.

The authority found pollution caused by organic materials and explosives. Among other things, traces of the highly poisonous RDX compound were detected, at a level three times higher than legally allowed. RDX is used in the production of explosives.

Unacceptable levels of certain organic materials used in the preparation of military ammunition were also found. This is the first time pollutants have been found in the area.

The Water Authority says they took the sample from an area where drilling had been done to obtain irrigation water. Mekorot plans to conduct more drilling in the area to pump out salt water, and prevent it flowing into fresh water, but says it has pushed off the plans until more tests are conducted.
Based on an analysis of water flows in the area, officials at the Water Authority believe that the newly found polluted materials result from activity undertaken in the Ram industrial park.

Between the 1960s and 1980s, a munitions factory operated at the site. The factory specialized in recycling old forms of ammunition for use as explosives. Materials were imported from American armed forces then deployed in Vietnam.

The Water Authority has announced that it will work with the Environmental Protection Ministry and Mekorot to carry or more tests, and determine the precise levels of pollution. Officials suspect that other polluted areas will be found in the region.

During the past decade, a series of areas scarred by land and water pollution from military industrial activity and IDF bases have been identified around the country.

Sites in Tel Aviv, Ramat Hasharon, Herzliya and Ramle, among others, have been identified as polluted.

" Water Authority finds high levels of pollution near former munitions plant", Haaretz, 07/12/2011, online at: http://mideastenvironment.apps01.yorku.ca/?p=3793

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❖ Water shortages in Dead Sea could increase tensions in Middle East

Scientists studying ancient mud samples taken from the bed of the Dead Sea separating Israel and Jordan have warned that the fragile political situation in the Middle East will be made worse by the intense water shortages their study is predicting.

Sediment cores drilled about 900ft down in the centre of the Dead Sea's muddy basin – an environmental record stretching back 200,000 years – have shown that the giant lake has dried out in the past. This suggests that taking freshwater from rivers for irrigating crops could make a regional, prolonged drought almost inevitable.

Researchers said their findings suggest that the entire water cycle in the region is being destabilised by the over-abstraction of water from rivers that drain into the Dead Sea and the Sea of Galilee, and that this could lead to conflict between Israel and its neighbours.

"The Dead Sea is already drying up because humans are using so much water. The evidence it has actually gone away without any human intervention, under conditions that might return soon, is something people should think hard about," said Steven Goldstein, a geochemist at Columbia University's Lamont-Doherty Earth Observatory in New York. "As of now, virtually no freshwater is entering the Dead Sea. All the water in the valleys is being used, and that's part of the problem...[global warming] models predict that the water now flowing down the rivers that is being used won't be going down the rivers any more," Dr Goldstein said.

Water is already an intensely political issue in the Middle East but the discovery that the Dead Sea dried out completely during the last interglacial period some 125,000 years ago suggests that the region is more vulnerable to catastrophic drought than many expert had previously believed.

"Now that we have evidence from cores that the lake did actually dry down, all the previous climate models must be reconsidered [because] the lake might actually go dry much sooner... There are political implications of this big drying down because water is what causes wars," Professor Emi Ito of the University of Minnesota said.

"Water shortages in Dead Sea could increase tensions in Middle East", 07/12/2011, online at: http://www.independent.co.uk/news/science/water-shortages-in-dead-sea-could-increase-tensions-in-middle-east-6273289.html

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❖ Dead Sea Dried Up in Past

SAN FRANCISCO, CALIFORNIA—The Dead Sea region has been a center of human activity for hundreds of thousands of years—and the layers of sediments buried beneath the lake, scientists think, hold clues to the changing environment in which those cultures existed. Now, an analysis of sediments drawn from the center of the lake basin reported here this week at the American Geophysical Union's annual meeting reveals that, contrary to what scientists previously believed, the lake once completely dried up.

The study is part of the Dead Sea Deep Drilling Project, a $2.6 million effort begun 10 years ago to recover the longest, most continuous, and best-preserved archive of environmental and seismic information in the Middle East. Following two drilling efforts, one lasting from November 2010 to January 2011, and one in March 2011, project researchers have now extracted a 1-kilometer-long core of sediment from the center of the basin, representing roughly 200,000 years of climate and seismic data for the region. The biggest surprise so far? About 120,000 years ago, the Dead Sea essentially dried up.

Scientists didn't think that would happen. At 425 meters below sea level, the Dead Sea is at the lowest continental elevation on Earth, and it is about 34% saline. That extreme saltiness, scientists thought, would ultimately prevent the lake water from completely evaporating. They were convinced that the lowest the water level in the Dead Sea could sink was about 150 meters below its current level.

But a layer of pebbles discovered in the new core calls that assumption into question, team member Steven Goldstein, a geochemist at Columbia University's Lamont-Doherty Earth Observatory in Palisades, New York, said at a press conference at the meeting. Most of the core is a series of black and white layers of sediment, representing seasonal variations. Dark sediments containing mud and silt from winter floods alternate with summertime sediment rich with white calcium carbonate precipitated from a seasonally shrinking lake. "It's an absolutely phenomenal record," Goldstein said.

Overprinted on those finely detailed, seasonal layers in the core is a similar but larger-scale variation between wetter ice ages and drier interglacial warm periods. "Salt represents the Dead Sea declining and precipitating out the salt, which wasn't happening during the ice ages," Goldstein said. And in the core, about 235 meters down, the layer of pebbles appears. It is likely a beach deposit where the center of the lake used to be. The pebbles sit atop a 40-meter-thick layer of salt. Together, the scientists reported, they reveal an extreme drying event.

It's an important finding—and, significantly, these results are also the product of an international collaboration that includes both Israeli and Jordanian scientists, Ulrich Harms, the executive secretary of the International Continental Scientific Drilling Program, said at the press conference. That collaboration is particularly key in a region where political and societal needs, rather than climatic change, are now diminishing the amount of water flowing into the basin, said Harms, who was not involved with the study. Over the past 80 years or so, countries in the region have increasingly siphoned off fresh water for irrigation from the Jordan River, the primary feeder river into the basin. As a result, the water level in the Dead Sea has been dropping dramatically. In 1997, the lake level was 411 meters below sea level. By 2008, the level had dropped another 10 meters, and

by 2010, it had dropped 3 meters farther. However, given the evaporation constraints, scientists thought it would never completely disappear. Now, they say, the new data suggest otherwise.

"Dead Sea Dried Up in Past", 07/12/2011, online at: http://news.sciencemag.org/sciencenow/2011/12/dead-sea-dried-up-in-past.html?ref=hp

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❖ Could the Dead Sea Completely Vanish?

SAN FRANCISCO — Water levels in the Dead Sea have been dropping over the last few years as towns and villages in Israel, Jordan, Lebanon, Palestine and Syria suck up run-off water that would normally fill the extra-salty lake. But new research finds that even in periods without human pressures, the Dead Sea may have dried up, including once when it did so almost entirely more than 100,000 years ago.

The finding does not bode well for the region, according to study researcher Steven Goldstein, a professor at the Lamont-Doherty Earth Observatory at Columbia University. If the giant body of water nearly vanished with no human pressures, what could be the consequences with both man-made climate change and water diversions for irrigation that keep much of the resource from even reaching the Dead Sea?

"Without human intervention during the last interglacial, the run-off declined or stopped," Goldstein said here Monday (Dec. 5) at the annual meeting of the American Geophysical Union (AGU). Already, he said, water has been a source of tension in the region.

With climate change, the Dead Sea region is expected to become more arid, resulting in more pressure on water resources. And recent signs suggest things are already happening; in 1930 the lake's surface was 1,280 feet (390 meters) below seal level, dropping to 1,381 feet (421 m) below sea level in 2008 due to water being used up by humans before it could even reach the lake, the researchers said**.**

Disappearing sea

The Dead Sea is the lowest continental point on Earth. With 33.7 percent salinity, it's famous for the extra buoyancy swimmers get from its high salt content. But the lake has shrunk and grown over the eons, and the new study finds that those changes have occasionally been very extreme.

As part of the Dead Sea Deep Drill Core Project, Goldstein and other colleagues drilled deep below the lakebed of the Dead Sea in 2010 and 2011 to pull up more than 1,300 feet (400 meters) of sediment in a long column — a record of sediment deposits spanning 200,000 years.

The record captures nearly every season in that time period, Goldstein said, with white layers of a mineral called aragonite marking summer evaporations, when the minerals were left behind as water vanished. Dark layers mark winter floods and sandstorms, which dump dark silt into the lake. The silt then filters to the lake bottom, leaving a record on the lakebed.

The researchers themselves witnessed both of these sorts of events live: At one point, they stood by as a flash flood washed dark sediment into the lake. On another day, a sandstorm with 100 mph (161 kph) winds disrupted their drilling.

Rock layers on the shore had already revealed that the lake has fluctuated in size, filling the entire Jordan Rift Valley during the last Ice Age. But the newly unearthed core showed that during the last

interglacial period, about 120,000 years ago, the lake dried up, perhaps entirely. At that point, Goldstein and his colleagues found a layer of round beach pebbles on top of a 147-foot (45-m) layer of mostly salt.

"It looks like the beach deposits that we see on the shore," Goldstein said. But this core was taken in what was then the center of the lake basin.

The find means that at this time, in the warm period before the last Ice Age, the Dead Sea dried up dramatically, leaving its salt behind — "about how much salt we would expect if we were to take the Dead Sea today [and] we were to evaporate it," Goldstein said.

A little help from humans

That past dry-down was climate-driven, said Zvi Ben-Avraham, chief scientist on the project and a researcher at Tel-Aviv University. But today the lake is threatened more directly by humans.

"What we see here happening in the Middle East is something that mimics a severe dry period, but this is not climate-enforced, this is a man-made phenomenon," caused by water being pulled from rivers for irrigation before it ever gets to the Dead Sea, Ben-Avraham said.

Researchers aren't yet sure how long the previous lake dry-down took, but the research has changed their conception of the history of the lake. [A Gallery of Stunning Lakes]

"The global warming scenario is definitely predicting that the area is going to be even drier and warmer than it is today," said Emi Ito, a study researcher from the University of Minnesota. "The previous models of lake-level decline indicated that the lake will not completely dry down, but stabilize at 100 to 150 meters [328 to 492 feet] below current level."

Now, however, Ito said, the core shows that the lake has previously almost entirely disappeared.

"The lake may actually go dry much sooner, because the lake dry-down or almost-dry-down happened 120,000 years ago happened without human intervention," Ito said, "and we're helping the lake dry down much sooner."

"Could the Dead Sea Completely Vanish?", 06/12/2011, online at: http://www.livescience.com/17324-dead-sea-completely-vanish.html

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❖ Denying Palestinians Fair Access to Water

Water is essential to life. Denying it is criminal.

Water and sanitation are recognized as indispensable human rights. In July 2010, the General Assembly's Resolution 64/292 affirmed it. It called on member states and international organizations to:

"provide financial resources, build capacity and transfer technology, particularly to development countries, in scaling up efforts to provide safe, clean, accessible and affordable drinking water and sanitation for all."

Dozens of countries incorporated water rights in their constitutional or statute laws. Most, however, haven't fulfilled promised goals.

In her 2002 book titled, "Water Wars: Privatization, Pollution, and Profit," activist/ecologist Vandana Shiva called water rights natural and "usufructuary....water can be used but not owned."

It belongs to everyone as an essential "basis of all life. (U)nder customary laws, the right to water has been accepted as a natural, social fact."

Shiva's nine water democracy principles, include:

(1) it's nature's gift;

(2) it's essential to life;

(3) "life is interconnected through water;"

(4) it must be free "for sustenance needs;"

(5) it's limited and exhaustible;

(6) it must be conserved;

(7) it's a commons;

(8) "no one has a right to overuse, abuse, waste, pollute," or own it; it belongs to everyone; it can't be treated as a commodity; and

(9) there's no substitute.

The International Covenant on Economic, Social and Cultural Rights (ICESCR) affirms adequate clean water as an essential human right.

The Committee on Economic, Social and Cultural Rights' (CESCR) Comment No. 15 states:

"(T)he human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses."

In violation, Israel arbitrarily disconnects or excludes Palestinians from water sources, services or facilities. It contributes to polluting and reducing their resources. It fails to protect their distribution systems.

It hasn't adopted or implemented a water policy designed to ensure equitable supplies for everyone. It also failed to provide Palestinians with essential minimum availability to allocate disproportionate amounts to settlers and Israeli Jews.

Al-Haq's Report on Israel's Water Policy

On November 29, the human rights organization Al-Haq published a report titled, "The Right to Water - A Policy of Denial and Forced Displacement in the Occupied Palestinian Territory," saying:

For many years, Palestinians "suffered from a shortage of clean, safe water." With several productive aquifers, the Jordan River, and other natural water sources, scarcity's not the issue.

Israeli policy's at fault. By appropriating and controlling Palestinian water sources, unequal distribution resulted. Systematic discrimination allocates most water to Israel, its settlements, and East Jerusalem's Jewish communities.

As a result, Palestinians have been gravely impacted. Around 313,000 people in 113 communities aren't connected to a water network. They depend on costly private sources delivered by truck. Another 50,000 in 151 communities have less than 30 liters per capita daily (lpcd).

The World Health Organization (WHO) recommends minimally 100 lpcd. Average daily Palestinian consumption is 70 lpcd. Many communities get only 20. WHO calls it the minimum amount for "short-term survival" in emergency/disaster situations.

The inequality level between Jews and Arabs is appalling. Israel's Dead Sea Mitzpe Shalem and Qalya settlements consume about 700 lpcd. Beda'ot and Ro'i Jordan Valley settlements enjoy over 400 lpcd solely for household use.

Nearby Palestinian al-Hadidya village gets 22 lpcd. About 500,000 West Bank settlement Jews consume around six times more water than 2.5 million Palestinians. Including agricultural use, the disparity's much greater.

Israel appropriates 70% of Eastern Aquifer water. Palestinians without springs, wells and other natural sources must travel long distances for access or pay exorbitant privatized prices. In contrast, settlers enjoy plentiful supplies for drinking, irrigation, gardens, and swimming pools.

Around 1.6 million Gazans have one source only - the Coastal Aquifer's southern end. Israel denies importing water from natural supplies. To compensate, Palestinians over-used their one source at twice its annual sustainable yield. As a result, Gazan water quality experienced progressive deterioration.

While Gazans have marginally more water than West Bank Palestinians, 90 - 95% of it "is polluted by raw sewage and the infiltration of seawater, which is itself contaminated by raw sewage."

As a result, serious waterborne diseases are common, including "watery diarrhea and acute bloody diarrhea." Both are major causes of death. In addition, the Coastal Aquifer has nitrate levels exceeding WHO standards by up to 1,600% and chloride ones of 1,200%.

Under siege, moreover, materials necessary to improve water and sanitation infrastructure are denied. Through mid-2011, 17 water and sanitation projects were on indefinite hold due to lack of what's needed to implement them.

It's estimated that all natural Gazan water will be unusable by 2016. As a result, the Strip will be unfit for human habitation.

In the West Bank's Israeli controlled Area C, Palestinian cisterns, wells and springs are regularly destroyed. At times, water infrastructure is also to free more water up for settlers. Israel also targets rooftop storage containers, water tankers and tractors used to transport water, including ones belonging to humanitarian organizations.

From January - July 2011, 755 Palestinians were forcibly displaced following destruction of

their homes as well as water and irrigation infrastructure. The welfare of another 1,400 were also adversely affected.

In addition, settlers regularly attack Palestinian water sources and infrastructure. Vandalism includes filling a distribution pipe with concrete, dumping raw sewage, diapers, and chicken carcasses into spring water, and using large rocks to impede its flow. These and others like them happen regularly with impunity.

Israel's Separation Wall not only steals Palestinian land, it denies them access, including often to water sources. In fact, the Wall's path "clearly places control of Palestinian water sources in the hands of Israel." It entirely denies them access to the water-rich Western Aquifer.

Cut off from two-thirds of their land, Jayyus villagers get only 23 lpcd. In summer, it's rationed to two hours daily. Qalqilya's 43,000 residents have been separated from 80% of their agricultural land as well as 11 wells.

International law obligates Israel to fulfill its occupying power obligations. So do numerous UN resolutions about respecting Fourth Geneva and other human rights and humanitarian law provisions.

Israel spurns all international laws with impunity, including to nondiscrimination, work, housing, property, healthcare, education, and environmental health. They get away with it because world leaders don't enforce accountability.

A Final Comment

On November 30, the Palestinian Center for Human Right (PCHR) noted that December 3 marks UN International Day of Disabled Persons (IDoDP).

In 1992, the General Assembly proclaimed it to stress respecting, advocating and protecting their rights globally.

Nonetheless, disabled Palestinians are abused, not protected. Since January, Israeli soldiers killed two disabled children, saying they encroached too close to Israel's border. Testimonial evidence refutes it.

Moreover, one child suffered from partial mental disability and speech impediments. Yet, 400 meters inside Gaza, ten bullets, mostly to the head, killed him. Shrapnel from an Israeli shell killed the second one. He was 300 meters from Israel's border.

Since the beginning of the September 2000 second Intifada, Israeli soldiers killed 89 disabled Palestinians, including 15 children and seven women. They also wounded at least another 105.

Moreover, 45 physically or emotionally disabled Palestinians are incarcerated in Israeli prisons under appalling conditions. Some suffer from muscle paralysis or atrophy. Others lost limbs. Some were offered essential medical care only in exchange for spying for Israel.

Others experienced other abusive treatment. Overall, security forces make no effort to avoid further harm to disabled Palestinians. Instead of helping and protecting them, they exploit their limitations to enforce occupation harshness.

Rights afforded them under the 1999 Palestinian Disability Law Number 4 are denied, including Article Two, stating:

"The disabled have the right to enjoy a free life, dignified living, and various services in manner equal to that of other citizens and he/she shall have the same rights and obligations that are within his/her capabilities. It is not permissible to prevent any disabled (person) from enjoying these rights because of his/her disability."

Like its other legal obligations, Israel spurns special protections for disabled persons, children, the elderly, infirm and ill.

In Israel and Occupied Palestine, only Jews matter. Increasingly, only privileged ones like in America and other Western societies.

Others are marginalized, exploited and forgotten. Social justice long ago was abandoned to enrich profiteers and top 1% elites.

Why else would rage be spreading everywhere for rights much too long denied. In Occupied Palestine, they never existed, even for those most in need.

“Denying Palestinians Fair Access to Water”, Stephen Lendman, 07/12/2011, online at: http://www.indybay.org/newsitems/2011/12/07/18701942.php

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❖ Israel failing to protect the environment

The neoliberal coalition will try to solve urgent problems only and refuse to allocate resources to the environment because "there are more important matters." It will not allow Israel to address pollution, overcrowding and the depletion of our natural resources.

If an international environmental expert had overheard the discussion two weeks ago in the Defense Ministry's construction division, he would have been amazed. The heads of the ministry - which is up to its neck in Iran, Gaza and whether girls should be allowed to sing at army functions - were discussing with the Environmental Protection Ministry how to promote green construction in the Israel Defense Forces. The international expert would have been delighted to hear that this move is designed to mesh with the government's strategy of green growth that organizations like the OECD and United Nations have been calling for throughout the world.

If that same expert had stuck around after the discussion, he would have quickly realized that this government is suffering from a serious case of split personality. As it pats the Environmental Protection Ministry on the back and encourages it to design an environmental future, it continues with its (not green) business as usual.

A month ago the government agreed to prepare a plan for green growth to be led by the Environmental Protection Ministry. The plan would be based on planning and utilizing natural resources and encouraging employment in industries that develop environmental technology such as water conservation, energy and waste management. The plan encourages the consumption of environmentally friendly products and wants subsidies canceled for products that endanger the environment such as polluting fuels. The aim is to cut the nexus between economic growth and environmental harm so that increased output and productivity will not increasingly pollute and destroy natural resources.

The green-growth strategy has been adopted by the OECD and United Nations as a central tool for dealing with the world's severe environmental crisis, as well as the global economic crisis. While it's hard to charge these organizations with social radicalism, they stress the economic sense in developing technology for finding alternatives to oil, using raw materials more effectively, and conserving energy and water.

The same government that supposedly adopted this strategy will soon, in applying the Trajtenberg report's recommendations, approve decisions that entail the defeat of appropriate planning processes and a worrisome neglect of the environmental and health implications of economic activity. The government intends to allow a considerable increase in the number of gas stations and to lower demands in environmental protection at large infrastructure projects such as the expansion of Haifa Port. These actions are likely to very badly damage the marine environment and open spaces.

A few weeks ago, the government decided to set up 10 new communities in the Arad area, a typical example of wasting natural resources. The Netanyahu government's split personality in its attitude toward green growth fits in with its cognitive dissonance in all spheres. The government believes it can be "democratic" while shutting the mouths of political opponents, continue in the familiar format

of a free market while declaring its commitment to social justice, and trample on the environment while still expecting something green to grow out of it.

The results of this policy were analyzed recently by the Jerusalem Institute for Israel Studies and the Environmental Protection Ministry in their "Sustainability 2030" study. The significance in continuing this policy, they say, is control by a neoliberal coalition that favors market forces that will overcome a political coalition that favors a mixture of growth, environmental protection and social sensitivity.

The neoliberal coalition will try to solve urgent problems only and refuse to allocate resources to the environment because "there are more important matters." It will not allow Israel to address pollution, overcrowding and the depletion of our natural resources.

"Israel failing to protect the environment", Zafrir Rinat, 11/12/2011, online at: http://www.haaretz.com/print-edition/opinion/israel-failing-to-protect-the-environment-1.400734

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❖ Life Without Water a Growing Threat

GAZA CITY, Dec 9, 2011 (IPS) - "Taking our water is not like taking a toy. Water is life, they cannot play with our lives like this," says Maher Najjar, deputy general director of the Coastal Municipalities Water Utility (CMWU) of the recent Israeli threat to cut electricity, water and infrastructure services to the occupied Gaza Strip.

"Everything will be affected: drinking and washing water, sewage and sanitation, hospitals, schools and children," says Ahmed al-Amrain, head of power information at the Palestinian Energy and National Resources Authority (PENRA).

The Israeli Electric Company provides 60 percent of the Strip's needs, paid by Palestinian customs taxes collected by the Israeli authorities.

Gaza buys 5 percent from Egypt and tries to generate the remaining 35 percent at Gaza's sole power plant, maimed by the 2006 Israeli bombing and destruction of its six transformers.

On Nov. 26, Israel's deputy foreign minister, Danny Ayalon, threatened to cut Israeli electricity, water and ties to Gaza's infrastructure serving the 1.6 million residents of the Gaza Strip.

"This is the true meaning of collective punishment," says Jaber Wishah, deputy director for branches affairs at the Palestinian Centre for Human Rights (PCHR). "Children, women, elderly, patients, students, all are subject to this threat."

Following the 2006 democratic elections which brought Hamas to power, Israel has imposed an increasingly severe siege on the Strip, depriving Palestinians of most essential and basic goods, including livestock, medicines, machinery and replacement parts, and the industrial diesel needed to run the power plant.

"Israel has been steadily cutting electricity and destroying infrastructure over the years, but this is the first time they have explicitly threatened to fully cut everything," says Wishah. "It is absurd to blackmail the population with their lives because of political issues."

It is also illegal.

Wishah and Israeli rights group Gisha note that Israel continues to militarily occupy and control the Gaza Strip, despite the 2005 pullout of Israeli colonists and military bases from the Strip.

According to international law, Gisha says, Israel is responsible for the well-being of the Strip's population, including ensuring electricity, water and a functioning infrastructure.

Under its siege, Israeli has since 2007 limited the amount of fuel and industrial diesel allowed to enter Gaza, resulting in daily power outages throughout the Strip, ranging from 8 to 12 hours, and interrupting water, sanitation, health and education services.

"Palestinian electricity technicians have asked Israeli government to repair a main line recently damaged, as has the Israeli Electric company. But the Israeli government refuses to do so," says Ahmed al-Amrain.

"The lack of electricity, he says, "will oblige families to buy diesel for small generators indoors, which can lead to serious accidents and burns."

More than 100 Palestinians died in 2009 and the first quarter of 2010, Oxfam reports, from generator-caused fires and carbon monoxide inhalation.

While generators allow some vital machinery to run during power outages, other services, like laundry, are not run on generators. "There is not enough electricity," says Amrain. "They are for emergencies only and are made to run for short periods, not continuously. They are absolutely not an alternative solution for electricity in the Gaza Strip."

"It will be a complete catastrophe if Israel cuts the electricity. Half of the population would not have access to water," says Maher Najjar.

Currently 95 percent of the ground water is undrinkable according to WHO standards which reports that nitrates, believed to be carcinogenic, are over 330 mg/litre, far exceeding the 50 mg/l accepted levels.

"Since 2000 we have had plans to repair and expand water projects in Gaza, but until now only about seven of 100 projects have been completed," says Najjar.

According to Najjar, just 10 percent of Gaza's 1.6 million residents get water every day. Another 40 percent get water every two days, 40 percent get water every three days, and 10 percent get water once every four days.

"Israel has drilled over 1,000 wells around the Gaza Strip for their own use. They cut the water flow before it even reaches Gaza," says Najjar.

While the amount of water supplied by Mekorot, Israel's national water company, is just 5 percent, it is the threat of Israel cutting electricity and infrastructural needs that most haunts Gaza residents. "Chlorine is vital for our water treatment. Without it, we cannot pump a drop off water," says Najjar.

Already, for want of adequate electricity and treatment facilities, up to 80 million litres of partially and non-treated sewage is pumped into Gaza's sea daily.

In 2008, the WHO reported dangerous levels of faecal bacteria along a third of Gaza's coast. By 2010, the United Nations Relief and Works Agency reported that acute bloody diarrhoea and viral hepatitis remained the major causes of morbidity among refugees in the Strip.

"We need continuous electricity to pump waste-water from homes to sewage treatment plants," says Najjar. "Generators substitute during power cuts, but without the regular supply of electricity, waste will flood the streets."

In August 2007, a sewage holding pool in Beit Lahiya overflowed, drowning five residents of the village nearby.

Hamas maintains that it would accept a Palestinian state within 1967 borders. These are borders which Israel has yet to define and continues to blur with expanding illegal Jewish settlements and occupation of Palestinian land.

"I think the Israelis are serious with their threat," says Wishah, "because they don't pay any attention to the international opinion, nor to international laws and conventions, like the Geneva Conventions, that they've signed, which forbid collective punishment. They feel they are above the law and beyond any legal pursuit." (END)

“Life Without Water a Growing Threat”, Eva Bartlett, 09/12/2011, online at:
http://www.ipsnews.net/news.asp?idnews=106154

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❖ Land Set Aside For Gaza Desalination Plant

The Palestinian Water Authority has been instructed by the government to allocate 30,000 m² of land in Gaza for a desalination facility with a capacity of 100 million m³/year.

The instructions came from President Mahmoud Abbas, who has formed a higher committee to carry out a regional Arab regional tour to drum up funding for the plant, which could cost US$ 450 million.

The desalination plant and a distribution system was labeled as a humanitarian project in June 2011 by the Union for the Mediterranean (UfM), a multilateral partnership created by 43 Euro-Mediterranean heads of state in Paris on 13 July 2008. The facility would help to address a major water deficit for a population of 1.6 million.

The "labeling" of this large-scale project by the representatives of the UfM countries was partly based on a unanimous recommendation from the UfM's Water Expert Group. The UfM says the project will contribute to job creation and future economic and sustainable development in this highly populated region of the Mediterranean.

"Land Set Aside For Gaza Desalination Plant", 06/12/2011, online at: http://www.desalination.biz/news/news_story.asp?id=6248&channel=0&title=Land+set+aside+for+Gaza+desalination+project

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❖ Desalination plant could make Israel water exporter

(Reuters) - Israel's national water company signed a financing agreement to build a desalination plant, which officials said could allow drought-ridden Israel to export water to its neighbors upon completion in 2013.

Israel's ADL, a subsidiary of state-owned Mekorot, will build and operate the plant in the coastal city of Ashdod for 25 years, supplying 100 million cubic metres of desalinated water annually, the Finance Ministry said in a statement on Tuesday.

Israel is two-thirds arid and to avoid further depleting its fresh water sources it has become a world leader in desalination and wastewater recycling.

The new Ashdod plant will join four other desalination facilities that to provide, by the end of 2013, 85 percent of the country's household water consumption.

"In the coming years we will be able to return water to nature and even sell water to our neighbors," said Infrastructure Minister Uzi Landau.

ADL secured funding for the project from Israel's Bank Hapoalim and the European Investment Bank (EIB), the statement said.

The Finance Ministry had previously put a 1.5 billion shekel ($400 million) price tag on the plant, which will use reverse-osmosis to desalinate seawater from the Mediterranean, and said it will supply water at a cost of 2.4 shekels per cubic meter.

"Desalination plant could make Israel water exporter",06/12/2011, online at:
http://www.reuters.com/article/2011/12/06/us-israel-desalination-idUSTRE7B50V520111206

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❖ Water level drop brings garden watering ban

The Water Authority institutes a temporary ban on irrigating public and private gardens.
Talkbacks (3)

The Water Authority has instituted a temporary ban on public and private garden irrigation, which it says will be key to water conservation efforts in an era of rapid water loss and drought.

The four-month prohibition – which began on December 1 and will last through April 1 – has occurred annually since around 2001 and forbids all types of garden-watering, except in areas that fall between the southern tip of Israel and a borderline called the "minority rains line."

According to a map on the Water Authority website, this line begins at Israel's western border just north of the Sufa border crossing, and heads eastward north of Tze'elim, Hatzerim, Beersheba, Kasif and Arad. It then wraps around northward along the western coast of the Dead Sea and ending right below Yafit before hitting Jordan, but includes Tomer, Na'omi, Nahal Elisha, Vered Yeriho, Almog, Kalya, Mitzpe Shalem and Ein Gedi within its minority precipitation – and therefore acceptable-to-irrigate – bounds.

"From that line toward the North you must not water at all because it's winter – and when there is winter, there is rain," Water Authority spokesman Uri Schor told The Jerusalem Post on Tuesday, noting that the rule applies to gardens only, not potted plants inside the home.

In addition to continuing to institute this ordination, the Water Authority has provided "10 useful tips for saving water" during the months of April through November, when irrigating gardens is once again permitted. These guidelines include watering plants with sprinklers before 6 a.m., when there is no breeze; raising plants that are known to be frugal with water; allocating the amount of water necessary for irrigation according to the weather; equipping the garden with a computerized irrigation monitor; and covering the ground with copious amounts of soil to prevent dehydration.

In addition, the Water Authority suggests dividing gardens into sections according to watering needs; increasing the space between plants to strengthen their individual absorption; mowing lawns frequently; pruning unnecessary landscape; and using compost.

"Private gardens and public lawns are green lungs for all of us," the authority guidelines say.

This year's irrigation ban comes at a time when both Dead Sea and Kinneret water levels are incredibly low. As of December 1, the Dead Sea's water level was measured at 425.36 meters below sea level, a drop in 17 centimeters for the month – following drops of 11 and 10 centimeters in October and September, respectively.

"Seventeen is quite drastic," Schor said. "It was a very hot November."

Meanwhile, as of Tuesday, the Kinneret sat at 213.69 meters below sea level, still 69 centimeters below the body of water's bottom red line. During this November's rainy week, the Kinneret rose by

one centimeter, two weekends ago it dropped by half a centimeter, and last weekend, by a full centimeter, according to Schor.

"The last seven years of drought left our main sources of water with a loss of 1.5 billion cubic meters of water," he said. "Therefore, we need a lot of rain and to continue conserving."

"Water level drop brings garden watering ban", Jerusalem Post, 06/12/2011, online at: http://mideastenvironment.apps01.yorku.ca/?p=3781

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❖ '70% of Disi project completed'

AMMAN – Seventy per cent of the Disi Water Conveyance Project has been completed after work on the mega-project resumed earlier this week, according to a source involved in the implementation of the venture.

Mechanical and construction work on the project resumed after authorities introduced security measures to protect teams operating in the southern region between Al Hassa and Mudawwara on the Jordanian-Saudi border, said the source, who preferred anonymity.

Work on a major part of the Disi project was suspended for over a month after a shooting incident targeted Disi project engineers and vehicles late September.

"Security measures by the Royal Badia Forces are in place now to ensure the safety of our workers. We resumed partial work 10 days ago, and now we will continue with full force," the source told The Jordan Times.

Being carried out on a build-operate-transfer basis and implemented by the Turkish company GAMA, the Disi project seeks to provide the capital with 110 million cubic metres of water via pipeline, which will start at the ancient Disi aquifer in southern Jordan and end in Amman, passing through several water stations in Maan, Tafileh, Karak and Madaba.

A progress report, a copy of which was made available to The Jordan Times, indicates that the break pressure tank and the pressure regulator tank are ready, as well as over 95 per cent of water collection tanks and the Madaba bridge pumping station.

"Now, water pipes are being laid in trenches along the medical city street to convey water to the Dabouq reservoir," the source noted.

"The piezometer wells were drilled, 16 production wells were completed and work under way to complete 20 wells, all of which will be ready by next year," the source added.

Under the Disi project, which started in 2007 and is slated for completion in 2013, 64 wells will be drilled, 55 of which will be used for the generation of water, while nine will serve as piezometer wells to measure the elevation of water.

"'70% of Disi project completed", Hana Namrouqa, 07/12/2011, online at:
http://mideastenvironment.apps01.yorku.ca/?p=3789

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❖ New technical unit to manage Zarqa River rehabilitation

AMMAN – The Ministry of Environment is creating a new technical unit in charge of rehabilitating the Zarqa River Basin, one of the Kingdom's major environmental hotspots, according to Minister of Environment Yaseen Khayyat.

Based at the ministry, the unit will be supported by several government agencies and will coordinate efforts to rehabilitate the Zarqa River Basin, he said during the closing workshop of a five-year project for the rehabilitation of the basin on Thursday.

Khayyat underscored that further efforts are still needed to restore the ecological and cultural value of the river, which has suffered from pollution and depletion over the past three decades.

"The main goal of the rehabilitation programme is to change perspectives of the river as a landfill or a health hazard… stopping pollution of the river is a national responsibility," he noted.

Addressing the contamination of the Zarqa River, which originates from Ras Al Ain in Amman and flows into the King Talal Dam, has been a top priority for the Ministry of Environment since its establishment, according to officials.

But the severe pollution of the river from the influx of sewage and dumping by factories and farms located along its banks, coupled with low water levels, is hindering salvage efforts.

Khayyat said the first step towards rehabilitating the river is preventing pollution by controlling the disposal of solid and liquid waste, as well as managing the river's water flow.

"The ministry seeks to maintain a continuous flow of water in the Zarqa River and replenish it with unconventional water resources, such as highly treated wastewater, harvested rainwater and grey water," the minister noted.

He commended the Ministry of Water and Irrigation for helping address the causes of the river's pollution by prohibiting wastewater treatment plants, manholes or pumping stations from leaking untreated wastewater into the river.

The rehabilitation project, launched in 2008 by the environment ministry and the International Union for the Conservation of Nature (IUCN), aims at improving the Zarqa River Basin's environmental conditions by building the capacities of concerned authorities and raising the awareness of people and farmers residing along its banks.

The second largest tributary of the lower Jordan River after the Yarmouk River, the Zarqa River's watershed encompasses the most densely populated areas in the country, including Zarqa Governorate, which is home to 52 per cent of Jordan's industries and has a population of around one million.

Under the project, funded by the Spanish Agency for International Development Cooperation, the IUCN and the ministry encouraged farmers along the river bank to adopt environment-friendly methods which involve drip irrigation systems and the use of organic instead of chemical fertilisers, according to the ministry.

Spanish Ambassador to Jordan Javier Sangro de Liniers said the unit for the rehabilitation of the Zarqa River will start operating next month, highlighting that the project promotes coexistence between human beings and nature.

"The project demonstrated the concept that humans and nature can, and should, coexist in a way where development activities take into consideration the ecological needs of the system surrounding them," the ambassador noted.

"New technical unit to manage Zarqa River rehabilitation", Khayyat, Jordan Times, 07/12/2011, online at: http://mideastenvironment.apps01.yorku.ca/?p=3791

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❖ Gov't to probe Ramot Shapira for sewage dumping

Environmental Protection Ministry opens public investigation against Ramot Shapira for allegedly dumping sewage into the public domain.
Talkbacks ()

The "Green Police" at the Environmental Protection Ministry has opened a public investigation against the Ramot Shapira Educational Institution and its administrators for allegedly dumping sewage into the public domain, the ministry announced on Tuesday.

Through an initially undercover investigation that the office has been conducting since May, the Environment Ministry reported that it has gathered evidence the organization and its employees have been pumping sewage from the institution's pits into the local area. Ramot Shapira is located in Moshav Beit Meir just outside of Jerusalem, and next to the Masrek Nature Reserve.

After receiving a court order, a team of Green Police inspectors searched the grounds and confiscated accounting materials and other documents that strengthened suspicions against the institution, according to a ministry statement.

Thus far, the Green Police has investigated several officials from the organization, and the ministry said it intends to issue an indictment against them.

Attempts by The Jerusalem Post to obtain comments about the allegations from the institution were unsuccessful.

"Gov't to probe Ramot Shapira for sewage dumping", Sharon Udasin, Jerusalem Post, 07/12/2011, online at: http://mideastenvironment.apps01.yorku.ca/?p=3795

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❖ Study: Water wars likely in Middle East

LONDON, Dec. 7 (UPI) -- Using water from the Dead Sea means it's drying up, a resource loss that scientists said could destabilize an already tense Middle East political situation.

Sediment cores from below the Dead Sea indicate it dried up roughly 125,000 years ago and scientists say human activity might dry it up again.

"The Dead Sea is already drying up because humans are using so much water," Steven Goldstein, a geochemist at Columbia University's Lamont-Doherty Earth Observatory in New York, told London newspaper The Independent. "As of now, virtually no fresh water is entering the Dead Sea."

Scientists like Goldstein said the more the regional agricultural sector relies on water from the Dead Sea, the greater the chances for a prolonged drought.

This could create political conflicts between Israel and littoral states to the Dead Sea and the Sea of Galilee.

"There are political implications of this big drying down because water is what causes wars," Emi Ito of the University of Minnesota was quoted as saying.

"Study: Water wars likely in Middle East", 07/12/2011, online at: http://www.upi.com/Business_News/Energy-Resources/2011/12/07/Study-Water-wars-likely-in-Middle-East/UPI-28741323261852/

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❖ Middle East plagued by water disputes

CAIRO, Dec. 10 (UPI) -- Water shortages in Middle Eastern and African countries are getting worse amid climate change and political wrangling, Voice of America reported Saturday.

The report from Cairo said poor infrastructure adds to the woes for millions of impoverished citizens who have no reliable water system, while upscale health clubs leave showers running non-stop.

Government officials say Egyptians use 55 billion cubic meters of water per year, the report said.

More than 85 percent of that comes from the Nile River, which is also a critical supply source for upriver countries such as Ethiopia, Kenya, Uganda and Southern Sudan.

Those countries have long argued Egypt and Sudan are taking too much water, but those two countries maintain an old British colonial decree grants them rights to the river's water.

Meanwhile in Yemen, across the Red Sea from Egypt, the United Nations Development Program said the country's aquifers are declining at a rate that could see it run dry in five years, the report said.

"Middle East plagued by water disputes", 10/12/2011, online at: http://www.upi.com/Top_News/World-News/2011/12/10/Middle-East-plagued-by-water-disputes/UPI-10391323533467/?spt=hs&or=tn

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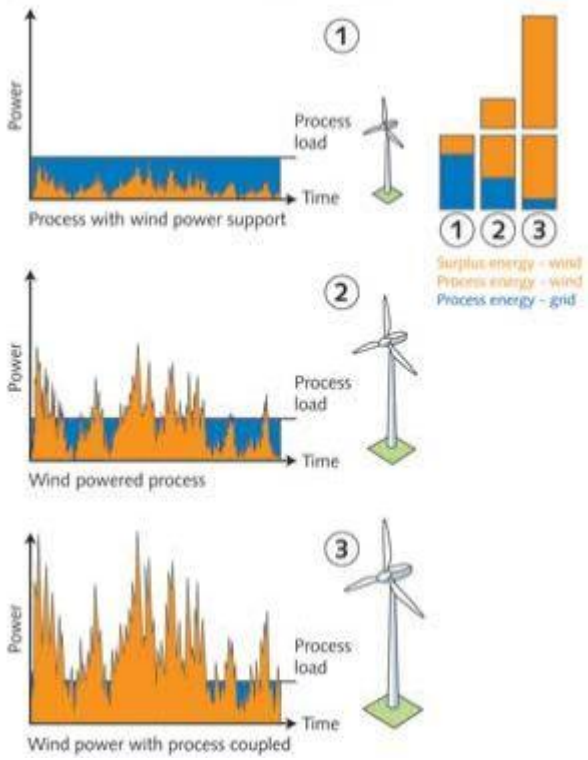
❖ Winds of Change for Reverse Osmosis Seawater Desalination?

Membrane desalination capacity is growing globally but so is its demand for power, usually supplied through fossil fuels. With renewable energy sources such as wind power being proven, are there opportunities to combine the two? Joachim Käufler, Robert Pohl and Hadi Sader discuss the practical and economical feasibility of wind powered seawater reverse osmosis.

Energy consumption of industrial scale seawater desalination has decreased significantly over the past few decades. Advantages in membrane technology and energy recovery devices have led to a relatively low specific energy consumption (SEC) of reverse osmosis (RO) processes to around 2 – 4 kWh/m³.

Lower energy consumption per unit, lower investment costs, a simple process control and a very flexible plant design have all helped RO to gain a significant market share within the field of small and large-scale desalination plants (< 100,000 m³ daily).

Figure 1. Process with wind power support



However, due to the ever expanding desalination market, total electric energy consumption of desalination, especially RO, will increase. With nearly all electric energy for commercial seawater reverse osmosis (SWRO) generated by fossil fuels, this presents challenges and concerns. This includes costs (energy can represent 30% to 60% of total water production (RO) costs), through to reliability. For example, if fossil fuel energy sources are supplied internationally, then reliability of supply could be affected negatively by political conflicts.

These concerns can be avoided or minimised by using locally available renewable energies, such as wind or solar power. And feasibility studies carried out could see wind powered RO desalination proven in Bahrain, in the Middle East.

In February 2011 a Memorandum of Understanding was signed between SYNLIFT Systems and Jade Consultancy to help develop the concept of wind powered seawater desalination. Extensive laboratory studies simulating Gulf region conditions suggest the concept is both technically and commercially available. The basis of which will be presented in the following article.

Why wind power?

As a freely accessible source, wind energy offers low and long-term stable power generation costs, as demonstrated in Table 1 below. Considering the steadily increasing grid tariffs, the direct consumption of wind power within a local sub-grid constellation is becoming the most beneficial option for an increasing number of sites.

Table 1.

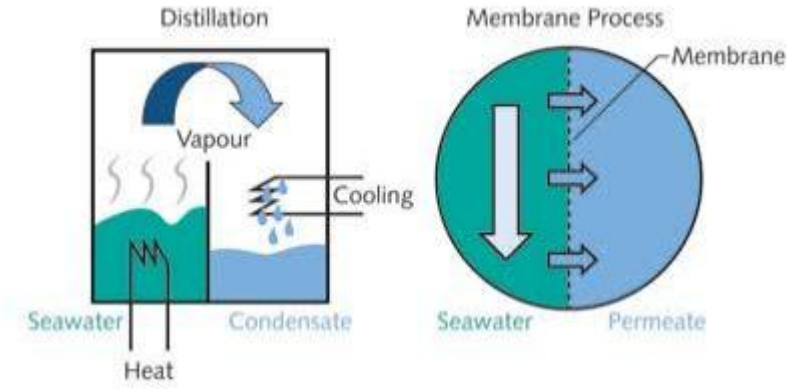
Power generation	Generation Costs	Cost increase	Volatility
Fossil fueled (> 5 MW)	3 – 10 €ct/kWh	3 – 5 % p.a.	medium to strong
Wind (> 500 kW)	3 – 10 €ct/kWh	< 1 % p.a.	Low
Photovoltaic (> 500 kW)	12 – 32 €ct/kWh	< 1 % p.a.	Low
Solar thermal (> 500 kW)	19 – 24 €ct/kWh	< 1 % p.a.	Low

Economic prognosis for a power plant installed in 2010 (Fraunhofer ISE partly)

Principles of seawater desalination

At an industrial scale, thermal as well as membrane processes are used for seawater desalination. The thermal desalination processes are characterised by the phase change of the seawater in which the product is separated by condensation of the vapour (see figure 2). Well-known applications of thermal desalination at industrial scale are the Multistage Flash Evaporation (MSF), the Multi Effect Distillation (MED) and the Mechanical or Thermal Vapour Compression (M/T VC).

Figure 2. Desalination scheme



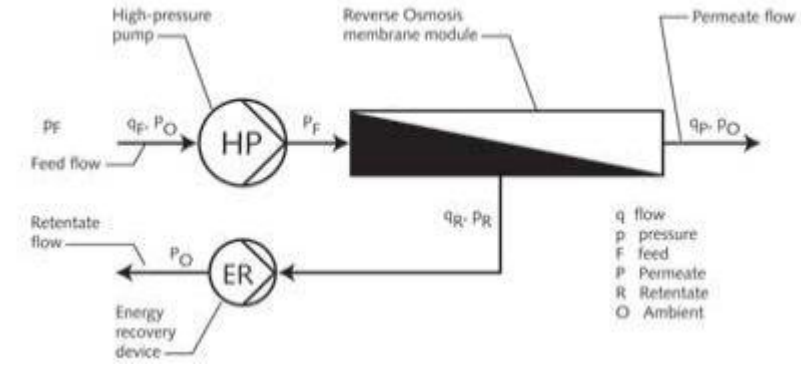
Membrane processes operate without phase change. By regulation of the chemical potential across a semi-permeable membrane a partial flow of seawater is separated as permeate. Within industrial seawater desalination, RO is increasingly important. For desalination of brackish water with lower salinities the Electro Dialysis is as well applied.

Compared to other desalination principles, certain characteristics make RO more suitable for a wind powered desalination process compared to other desalination principles [1-4]. These include a high process dynamic – the ability to adjust the power of the desalination plant quickly in the event of fluctuating wind power.

Principle of RO-process for seawater desalination

RO is applied as cross-flow filtration and pressurised seawater with feed flow flowing along the semi-permeable membrane. If feed pressure exceeds the osmotic pressure of the seawater a fraction of water diffuses through the membrane and is collected as permeate flow (see figure 3).

Figure 3. RO scheme



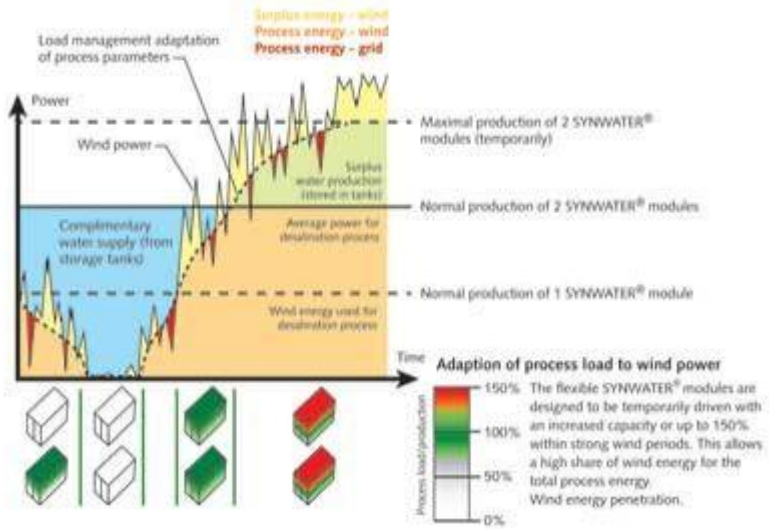
The retentate flow is depressurised by the downstream energy recovery device. Recovered energy is transferred as hydrostatic pressure directly to an equal fraction of the feed flow or indirectly by boosting the high-pressure pump flow.

The power of the high-pressure pump could be adjusted continuously within a broad range of feed pressure and flow in order to adjust the permeate production to varying water demand and feed conditions or – relevant for WIP – to the fluctuating wind power generation.

Variable operation of RO-process

Since RO is applied for seawater desalination, the concept of powering the process with abundant wind energy potential can be introduced and developed further. Within the RO-community to date there lacks conclusive assessment of whether thin-film composite membrane material deteriorates when exposed to a long-lasting variable process. To date industrial RO-plants are operated with constant process parameters and membrane suppliers recommend uninterrupted operation at nominal capacity, in order to maximise the full cost of the membranes.

Figure 5. Synwater principle



To reach a verifiable assessment, comparative long-term tests have been carried out by SYNLIFT Systems with variable and a constant operated membrane, respectively [5]. The performance deterioration due to compaction and reversible fouling – mainly affecting the RO-performance under constant operation – was investigated comparatively. For the variable operation, periodically altered process parameters were set in a way that at the beginning of the test run both membranes, which had the same feed power.

Altogether, in none of the test runs could a performance deterioration of the variable operated membranes compared to constant operated membranes be observed.

However, minor positive effects on membrane performance were encountered due to deactivation periods. External investigations derived similar conclusions [6].

System configuration

SYNWATER® modules together with integrated load and storage management permit an optimal direct use of the freely accessible and low-cost resource wind as process power. The surplus production and storage of potable water in strong wind periods and the complementary hybrid power supply (wind/grid) enable a safe and cost efficient water supply even in lull wind periods. Modules used are designed for medium (200 - 5,000 m^3/day) and large (more than 5,000 m^3/day) plant capacities.

Furthermore, the Kernel System consists of variable driven UF (ultrafiltration)/RO membrane combinations and is designed site-independent. High-grade pre-treatment and the special supervision procedure for the RO membrane characteristics allows a temporary increased production for the optimal use of strong wind periods.

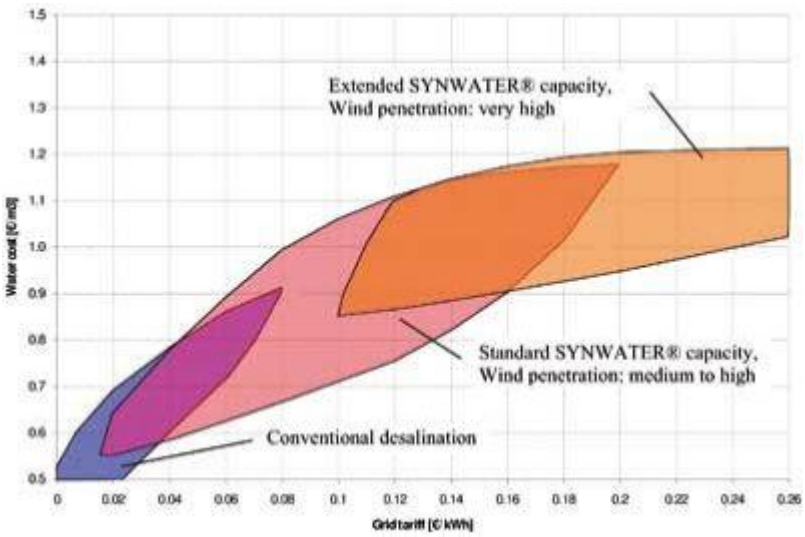
Economic consideration

The application of the load management depends strongly on the level of grid tariffs. Beside that, several techno-economic parameters will also affect the most economic configuration and operation of the process load. For broad range of possible SYNWATER projects, the techno-economic parameters are represented in the following table:

Table 3. Basic assumptions for SYNWATER (Project category: Wind Powered Process), no CDM effects considered.

Project		Wind Turbine		Desalination	
Project time	20 years	Investment cost	1.250 – 1.450 €/kW	Investment cost	800 – 1.100 €/(m³/d)
Interest rate	5 – 8 %	O&M cost	0,010 – 0,014 €/kWh	O&M cost	0,25 – 0,35 €/m³
Annuity factor	0,0802 – 0,1019	feed-in tariff	0,04 – 0,07 €/kWh	SEC	3,5 – 5,5 kWh/m³
		Capacity factor	25 – 35 %		

Three application fields are presented where – in relation to the average grid tariff at a site over 20 years – the respective application realises the lowest water production costs. For a grid tariff level up to 5 €ct/kWh in general (with an extended range in extreme cases) the conventional grid-connected desalination could be the most economical solution (figure 6 - blue).



Within the prevailing level of medium grid tariffs, ranging from 5 to 12 €ct/kWh (with an extended range in extreme cases), SYNWATER® technology with standard capacities provide desalination at lowest water production costs (figure 6 - rose). For grid tariffs higher than 12 €ct/kWh (with an extended range in extreme cases) it is recommendable to extend the SYNWATER® capacity above the nominal water demand resp. nominal process capacity, see figure 6 (orange).

Currently preparations are underway for the implementation of the first system module described above. Already today wind power offers low and long-term stable costs of energy and therefore is able to compete with large scale conventional power generation. Using wind power directly for energy intensive industrial processes requires an optimised hybrid configuration as well as a balanced load and/or energy management. WWi

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❖ Dasu hydropower project to contribute 21.3 billion units to national grid

LAHORE: A five-member team of consultants of the 4,320 MW Dasu hydropower project Saturday gave a detailed briefing to Lahore Chamber of Commerce and Industry's office-bearers on the low-cost energy plant which would contribute 21.3 billion units of electricity to the national grid. The benefits of the project have been estimated at about Rs 191.7 billion annually. The consultants team, comprising IIJIMA Motohiko, Project Manager/team leader, Dasu Hydropower Project, Hiroyasu Kitayama, Chief Material Specialist, Nippon Koei Co Ltd, Japan, Toshimitsu Tanaka, Nippon Koei Co Ltd, Muhammad Munir, Managing Partner Development and Management Consultants (DMC) and Ziaul Hassan, Deputy Project Manager discussed a number of technical issues with LCCI senior Vice President Kashif Younis Meher. Kashif Meher said the LCCI was ready to extend every help so that work on the mega hydropower project of national importance could be started at the earliest. He urged the consultants to have regular meetings at the LCCI as it had 18,000 members belonging to all sorts of businesses and they would be ready to facilitate the consultants. When the visiting team discussed the issue regarding provision of Flyash (a residue of coal used in construction of dams), he said the material could be made available in Pakistan and in this regard the LCCI would do the needful. The Dasu hydropower project is situated at 7 km upstream of Dasu village on the Indus River, 74 km downstream of Diamer Bhasha Dam and 350 km from Islamabad.

The project is located in district Kohistan of Khyber-Pakthunkhwa. Meher said the government's reliance on thermal generation had contracted hydel contribution in the total energy mix. The policy of generating more electricity through thermal power plants resulted in expensive generation that widened the gap between the cost of production and sale. Water and Power Development Authority (Wapda) had awarded the contract to a joint venture, Dasu Hydropower Consultants, for preparation of a detailed engineering design and construction supervision of the 4,320 megawatt Dasu hydropower project. The joint venture comprises two foreign and three local consulting companies including Nippon Koei of Japan, Dolsar Engineering of Turkey, Development and Management Consultants, National Development Consultants and Pakistan Engineering Services. staff report

"Dasu hydropower project to contribute 21.3 billion units to national grid", 11/12/2011, online at: http://www.dailytimes.com.pk/default.asp?page=2011\12\11\story_11-12-2011_pg5_5

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❖ Saving the Ganges

In a unique confluence recently, prominent Hindu and Muslim leaders gathered at the banks of the Ganges to appeal for action to save the Holy River.

As dawn lost its orange hues to the gathering darkness, the Assi Ghat lit up - literally and also with hope and prayers of the lovers of the great traditions of this land, who venerate Goddess Ganges.

Organised by the Ganga Mahasabha on the 150th anniversary of Madan Mohan Malviya in November, the event was attended by religious representatives from both the majority communities and included Kanchikamkoti Shankaracharya Jayendra Saraswati, Ram Katha Vachak Morari Bapu, Swami Chidanand Maharaj Muni ji, Muslim Personal Law Board's Maulana Kalbe Sadiq and Lucknow's Shahi Imam Maulana Fazlur Rahman.

All religious leaders spoke movingly about their respect for the Ganges and appealed to the government for urgent action to facilitate its cleaning operations. They also asked people to contribute by not polluting the Holy River.
Morari Bapu pointed out that as the 150th anniversary of Malviya ji was being observed, they should do a das-ansh (1/10th) and draft a 15-point agenda for the government and people to act.

The leaders gathered reminded the government of the days of Raj, when the Britishers had promised that the course of the river and other water bodies converging into it would not be restricted or changed through construction and also that any decision regarding the river would only be taken after the consent of the Hindus.

However, unfortunately, the Governments of Independent India had successively not kept the promise and dams are being built on the Alaknanda and Bhagirathi without consultation.

Former Professor of Kanpur IIT, now known as Swami Gyanswarup Sanand, warned that he would sit on fast unto death from January 15, 2012 if work on dams does not stop by Makar Sankranti.

Arun Gupta, an advocate of the Allahabad High Court, who has earned the name Ganga Ratna for his tireless crusade to save the Ganges, assured that the government has responded to their appeals and final touches would be given to the Ganga Act between Dec 27 and Dec 31 and then submitted to the Prime Minister.

Lucknow's Shahi Imam Maulana Fazlur Rahman said that water was the purest of the God's creation and man had been ordained by the Almighty to keep it clean. The Maulana added that he was ashamed that Muslims had failed in their duty to help Hindus to keep the river clean. He also pointed out at the sorry state of roads and garbage strewn in the ancient city to Varanasi.

Perhaps the most poignant of observations was made by Muslim Personal Law Board's Maulana Kalbe Sadiq who has always been on the forefront of speaking out about communal harmony. He said that he would not mind if for a 100 years no temple, gurdwaras, mosque or churches were built in India, but he would deeply pained if the Ganges was to perish. Because that would make India like

Pakistan, as India was not India without the Ganges. And he did not want to see the tragedy of India becoming Pakistan.

He also spoke tongue in cheek about how we had polluted Ganges which is originally sparkling clean. Kalbe Sadiq: "When I am in Haridwar, people ask me to drink water from the Ganges as it has curative value. When I am in Varanasi, people ask me to abstain from drinking the water, as I might fall ill!" Such he said was the sorry state of affairs.

The most touching moment was when Swami Chidanand Maharaj Muni ji gave Maulana Kalbe Sadiq 'Ganga jal' that he had brought from Gangorti. It was testament of the fact that Ganges is one of those invisible threads that binds this country together!

"Saving the Ganges", 09/12/2011, online at: http://zeenews.india.com/news/exclusive/saving-the-ganges_745758.html

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❖ A Swami's Hunger Strike Ends Mining on a Stretch of the Ganges River

An 11-day hunger strike by the swami of a small ashram ended on Monday night when the northern Indian state of Uttarakhand banned stone and sand mining from the Ganges riverbed near the city of Haridwar pending an environmental impact statement.

Officials slid the written order under the bolted door of a room of the Matri Sadan ashram, where 65-year-old Swami Shivanand had barricaded himself to prevent his arrest on charges of attempted suicide.

Shivanand read the order, unlocked the door, and broke his fast with glasses of lemon water and apple juice. This fast was Shivanand's sixth. The longest, in 2000, was 21 days.

Shivanand and his followers have been fighting since 1998 to defend the Ganges from the effects of mining. Their environmental cause is driven by a spiritual imperative.

Quarrying from the Ganges riverbed is a big business, one that appears to have infected the local government and law enforcement. Shivanand and his followers ("saints" in local parlance) have endured years of false arrests and assaults aimed at stopping their advocacy.

For example, here's a link to a video provided to me by the Matri Sadan from 2009. It shows a 20-year-old hunger-striker named Yajnanand as he is abducted by masked men. Local officials had come to the ashram with the stated purpose of having the young monk's condition assessed by a doctor. Instead, the video shows, men in balaclavas emerge from behind the trees and drag him away. (The first three and a half minutes are shaky and extraneous; the abduction begins around the 10:45 mark.)

Yajnanand was jailed for two months and force-fed through a nasal tube until a court ordered his release on grounds that he'd been illegally detained.

I first met Swami Shivanand last June, following the death of a senior member of the ashram. Swami Nigamanand, 38, had died after a 68-day fast. India's Central Bureau of Investigation is investigating if he was poisoned in his hospital bed by the state's so-called "mining mafia." A medical report lists "organophosphate poisoning" – pesticides, in other words, as a possible cause of death. (In 2003, another member of the ashram, Swami Gokulanand, was killed with an injection of scoline, a pre-anesthetic drug, while keeping vigil against developers in the Nainital forest.)

A May 26 ruling by the state's High Court shut down the operation that Nigamanand had been protesting. By that time, he was already in a coma. The court's decision spelled out the damage mining has done to the Ganges and surrounding farmlands.

According to the High Court, the mining and stone crushing, which feeds the state's construction industry, had made barren more than a million acres of farmland and orchards. By digging into the Ganges riverbed, the miners had lowered the water table to such an extent that irrigation wells and drinking water pumps had all gone dry.

On November 1, the state green-lighted mining on two nearby stretches of the river. An outraged Shivanand began his fast November 25. Having met him and his single-minded followers, I have no doubt he might have taken the hunger strike to the brink of death, if not beyond.

"The quality of a saint is to be brave, to be fearless," Shivanand told me. "A saint can make the other world tremble."

"A Swami's Hunger Strike Ends Mining on a Stretch of the Ganges River", 09/12/2011, online at: http://newswatch.nationalgeographic.com/2011/12/09/a-swamis-hunger-strike-ends-mining-on-a-stretch-of-the-ganges-river/

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❖ The big challenge for a new Egypt: water

Greater democracy in Egypt will threaten its hegemonic control over the Nile and force more co-operation with upstream states

Egypt is almost entirely dependent on the River Nile, which provides around 95% of its drinking and irrigation water. Protecting this supply has long been regarded as a matter of national security but the new political situation inside Egypt raises questions about its future.

Egypt's historical dominance of the Nile waters dates back to colonial era agreements made when Britain controlled much of east Africa and the Nile basin. The accords grant Egypt 55.5bn of the 74bn cubic metres a year of the Nile's usable flow.

Ethiopia and others have long been calling for a new order based on a developmental discourse and their right to the Nile waters, but Hosni Mubarak's regime used its political and military dominance in the region to stifle any tangible change in the hegemonic status quo.

Momentum for change had undoubtedly been building prior to Mubarak's fall: the Nile Basin Initiative was established in 1999; the co-operative framework agreement recently gained support by a two-thirds majority; and therefore, theoretically, a process of progression to the Nile Basin Commission could begin. This momentum is likely to intensify now that Mubarak is gone, and three emerging factors are transforming water dynamics in the Nile basin and bringing further challenges for Egypt.

First, the instability of the revolution has arguably diminished Egypt's regional presence and diplomatic strength in the basin. Incorporated in the Mubarak regime was a regional dominance, with significant support from the United States. This gave Egypt both a diplomatic and military advantage, which appeared insurmountable to the less powerful upstream states. For example, Egypt had consistently put pressure on the Arab League not to supply loans to Ethiopia for Nile water development.

With Mubarak's overthrow, a new optimism surfaced in the upstream countries. This is symbolised by Ethiopian prime minister Meles Zenawi's announcement of the Grand Ethiopian Renaissance dam at the end of March – just one month after Mubarak was ousted from power. The proposed dam, the largest in Africa, is forecast to generate 5250 megawatts of hydroelectric power, and has significant implications for Ethiopia and neighbouring countries that may also benefit from the energy produced.

Second, the newly independent South Sudan now has voting power as the 10th riparian state in the basin. With its own energy, infrastructure and resource needs, South Sudan is a relative unknown in its position on the Nile water agreements. However, its plan to build a dam in Wau, on a tributary to the White Nile, highlights its own independent needs, and is a further factor for Egypt to consider.

Finally, the increasing demand for agricultural land across eastern Africa, often described as "land grabbing", has significant implications for water use, as noted by a recent post on the Guardian's

Poverty Matters blog. Often, water rights are incorporated into land deals or leases, which is clearly outside the confines of traditional water use patterns.

External support for dam building, particularly with Chinese finance and expertise, as was the case with the Kekezze dam in Ethiopia, is a further important dimension. The impacts of such dams are not always clear, but their existence, and with foreign support, is a worrying development for Egypt.

These different factors present a fundamental challenge to Egyptian hegemonic control over the Nile. Democracy will not alter the importance of the Nile for Egypt but may reduce its capability to control it. New water strategies are one possible avenue, but can be only part of the solution. Greater co-operation with upstream states will have to become a key factor in the Egyptian Nile policy.

There are, of course, ethical questions about Egyptian hegemony over the Nile and the rights of upstream states to its waters. This is not to ignore their importance or validity, but to emphasise the implications for Egypt and its new political environment.

Water security is set to change in the Nile basin and the new democratic government in Egypt will have to act decisively and forcefully in a period of shifting power dynamics to maintain its supply at current levels. No one should be under any illusions – the stakes are high.

"The big challenge for a new Egypt: water", 07/12/2011, online at:
http://www.guardian.co.uk/commentisfree/2011/dec/07/egypt-water-nile?newsfeed=true

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❖ Explorers of the Nile: The Triumph and Tragedy of a Great Victorian Adventure

Identifying the source of the Nile fascinated the ancient world. Herodotus, Alexander the Great and the Emperor Nero all pondered how the river could flow unflagging through 1,200 miles of desert without the support of a single tributary. Yet not until the 19th century was the mystery solved. Drawing on new material available since Alan Moorehead's classic and accessible "The White Nile" published half a century ago, Jeal relates in this elegantly written and skillfully crafted book how a handful of Victorian explorers — Richard Burton, John Speke, James Grant, David Livingstone, Henry Stanley, Samuel Baker and his mistress, Florence von Sass — plunged into east and central Africa to uncover "the planet's most elusive secret."

Their motives were various — love of self, love of country, detestation of the slavery plaguing the region, and a desire to do good to Africa through Christianity, commerce and colonization. The rivalries among them were often fierce. In pursuit of their quest, they risked enslavement and death by illness, starvation and even cannibalism. They survived, as Jeal reminds us, only because of the help of numerous African interpreters, guards, guides, porters.

The sighting in 1858 by Burton and Speke of "an expanse of the lightest, softest blue" — Lake Tanganyika — was pivotal. Burton claimed the lake as the Nile's source. Speke — correctly as it happened — proposed the more northerly Lake Victoria, which he visited alone after Burton fell ill. Jeal provides a compelling dissection of the rivalry between the egocentric Burton — who earlier had made the pilgrimage to Mecca disguised as a Muslim peddler — and the blue-eyed, "tawny-maned" Speke. Jeal ably defends Speke against the charge of betraying Burton by going alone to the Royal Geographical Society — the expedition's sponsor — on returning to England in advance of Burton. He also suggests that Speke's death in 1864 on a partridge shoot on the very eve of a "great Nile debate" at which he and Burton were to air their disagreements about the source of the Nile was accidental and not, as Burton claimed, suicide to avoid "the exposure of +[Speke's] misstatements in regard to the Nile sources."

Unsurprisingly, given Jeal's previous well-received biographies of the missionary Livingstone and the journalist Stanley, the characters of these men are also well-drawn. Jeal traces the events and motives leading to their celebrated encounter near the shores of Lake Tanganyika in 1871. Livingstone had gone to Africa in 1865 in hopes of proving that Lake Tanganyika was — as Burton believed — the Nile's source. He was a competitive man who found the prospect of being the one to solve the Nile mystery appealing. He also hoped his expedition would publicize the extent of the Arab slave trade and open up the continent to more benign influences. To Livingstone, Africa's rivers — the Nile included — were "God's Highways."

For years there was no word of Livingstone, and many thought him dead. Stanley, an ambitious journalist backed by James Gordon Bennett, irascible owner of the New York Herald, hoped to make his fortune by tracking Livingstone down. In 1871 Stanley finally

succeeded, though he probably didn't greet the missionary with the famous words "Dr. Livingstone I presume." Jeal shows how Stanley — born in 1841, the year Livingstone first went to Africa, and consigned to a Welsh workhouse after his family rejected him — had always yearned for a father figure and, in Livingstone, found him.

Together they traveled to Lake Tanganyika only to find it could not, after all, be the Nile's source. Livingstone was by now exceedingly frail and suffering from numerous ailments — bleeding piles, rotting teeth and ulcerated feet to name but a few— but still determined to discover the Nile's watershed. His death near Lake Bangweulu, after Stanley had returned to Britain, devastated the younger man, who believed that continuing the exploration was "a legacy left me by Livingstone." Ironically, Stanley went on to prove in 1877 that Lake Victoria was indeed the Nile's source, vindicating Speke and proving Livingstone, his "honorary father," wrong.

As Stanley put it, Livingstone's journals exposing the evils of slavery stimulated "the civilized nations . . . to extend their care and protection over the oppressed races of Africa." However, as Jeal shows, such humanitarian arguments gave foreign governments a pretext to advance their territorial interests. Some explorers even became unwitting pawns in the "Scramble for Africa." Stanley himself was duped by Leopold II of Belgium, whose eyes — tragically as it proved for the Congolese — were upon the Congo.

Jeal plausibly suggests that the establishment of British, French and German colonies within the region investigated by the Nile explorers saved indigenous peoples from annihilation by Arab slave traders. Other conclusions of his geopolitical analysis — for example, that Britain withdrew from the region too soon — are perhaps more debatable. The greatest strengths of this highly enjoyable and readable book are Jeal's passion for his subject and his mastery of personalities as complex as the geography they battled to understand.

“Explorers of the Nile: The Triumph and Tragedy of a Great Victorian Adventure” ,Tim Jeal,04/12/2011, online at:https://apps.facebook.com/wpsocialreader/me/channels/read/content/dFk62?utm_source=redirect&utm_medium=headline&utm_campaign=gen_redirect&denyRedirect=http%3A%2F%2Fwpsocialreader.washingtonpost.com%2Ffbwapolabs%2Fme%2Fredirect%2Fwww.washingtonpost.com%2Fentertainment%2Fbooks%2Fexplorers-of-the-nile-the-triumph-and-tragedy-of-a-great-victorian-adventure-by-tim-jeal%2F2011%2F11%2F08%2FgIQArETMLO_story.html%3Fsocialreader_check%3D0%26denied%3D1#access_token=AAADNVm9BkVYBADT17nnG7A4WdN8ZCZA0Hw5W5SbZBvUbVTQj4yGlN7no1YJoC55pt42UroZAdsT4Fg9QMVcpmUsjg1GB8DMPZCQZBgNDbTCgZDZD&expires_in=5444&code=AQAuwgOIEhWbL-nNa5B21coXCa_va46pwZAoWqqtUf29nCA2Q7CAdUzb4ZZZdsgpCwOghILtXTN1XM0yT4KOJoP1svlSf0kiaUknLs-kfI3Bw-Jw3F5rTJxLAzecqqvNpLZLc_fy4m3g09KERx4soh3wspJH9BYiFXQ-A8kDywpouPNiDOFRzO6HCxBO1YZ2joQ

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❖ Post-Mubarak Egypt has softer line on Nile

CAIRO, Dec. 9 (UPI) -- With the downfall of Hosni Mubarak, Egyptian leaders are showing more willingness to discuss sharing the waters of the Nile River with Ethiopia and other African states that have been battling for a better deal to accommodate their swelling populations.

While Mubarak was in power, he used Egypt's political and military weight in the region to resist any change to the country's dominance of the Nile's waters that dates to the British colonial era.

But the Supreme Council of the Armed Forces, which forms the interim government since Mubarak was forced out by a popular pro-democracy uprising Feb.11, is displaying signs of being more cooperative in this long-running dispute.

This probably has a lot to do with the plethora of pressing problems Egypt faces as its moves through the uncertain transition toward political and economic reforms.

Apart from anything else, the independence of South Sudan July 9, splitting Sudan, Egypt's ally in the Nile dispute, in two, undercut Cairo's intransigence.

South Sudan, which has voting rights as the 10th riparian state in the Nile Basin, says it too wants to build hydroelectric dams on a tributary of the White Nile to give the impoverished, infant state an economic boost.

As early as September, SCAF agreed to set up a joint technical team with Ethiopia, the most vociferous of the upstream states demanding a more equitable share of the Nile's water, to review the impact of a $4.8 billion Grand Renaissance hydroelectric dam Addis Ababa declared it planned to build.

Experts from Sudan, another Nile state and Egypt's neighbor, will also take part in the team's operation.

Prime Minister Meles Zenawi, Ethiopia's strongman and Mubarak's fiercest opponent on the Nile issue, moved swiftly after the Egyptian dictator was toppled.

In May, Zenawi agreed to delay ratification of a 2010 agreement signed by six of the nine upstream states that stripped Cairo of the right under a 1929 British-orchestrated treaty to 75 percent of the Nile's flow, until a new Egyptian government was elected.

Egypt insisted on maintaining the 55.5 billion cubic meters it takes annually from the Nile, at 4,163 miles the world's longest river.

That's more than half the total annual flow of 84 billion cubic meters. Egyptian authorities say the country will need 86.2 billion cubic meters by 2017, a volume it cannot meet given its current resources.

The Nile, which rises in Lake Victoria in East Africa, is literally Egypt's lifeline. Most of its 81 million people live along its banks. Without the Nile, the ancient civilization that built the pyramids would never have emerged.

Zenawi infuriated Mubarak by building five big dams on the Nile over the last decade, defying Cairo's right under the 1929 treaty to have a veto over all upstream dam projects.

Apart from the Grand Renaissance Dam, which will be the largest in Africa, Ethiopia says it plans to build two other dams on the Nile as part of a program to boost its electricity production to 20,000 megawatts over the next decade.

President Yoweri Museveni of Uganda, another of the key upstream states lined up against Cairo, also wants to build a series of dams to boost his country's generating power from 300 MW to 3,800 MW over the next five years.

"We also have plans to generate 17,000 MW by 2025," Museveni said.

In September, Zenawi met Egypt's caretaker Prime Minister Essam Sharaf in Cairo in a further effort to reduce tension and negotiate a new agreement.

"We can make the issue of the Grand Renaissance Dam something useful," Sharaf said, indicating that progress was now possible.

"This dam, in conjunction with the other dams, can be a path for development and construction between Ethiopia, Sudan and Egypt."

There are other issues involved in the Nile dispute. But the most threatening is the scramble by non-African states such as Saudi Arabia, China, India and South Korea to buy or long-lease vast tracts of arable land in Africa to produce wheat, rice and corn for export to those countries.

These land grabs cut the food supply in famine-prone African countries and the export of grain to nations unable to grow enough for themselves -- like Egypt.

"Post-Mubarak Egypt has softer line on Nile", 09/12/2011, online at: http://www.upi.com/Business_News/Energy-Resources/2011/12/09/Post-Mubarak-Egypt-has-softer-line-on-Nile/UPI-36911323458245/

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❖ Water wars & boiling points

In a recent James Bond film, *Quantum of Solace*, the villain hatches diabolical plots to corner a certain South American country's fresh water resources. The Bond war is not over deposits of oil and gold but water. The conflict potential of water has clearly arrived even in the public's imagination.

In the backdrop of growing tensions over the sharing of water resources across the world and specially so in Asia, Brahma Chellaney's new book, Water: Asia's New Battleground, is both timely and relevant.
In its seven chapters the book deals with diverse aspects of water in Asia, the conflicts and disputes that exist already and those likely to exacerbate as the economic boom in this region drives demand for scarce water resources.
Many of these water resources will become further points of dispute as climate change melts glaciers, diminishes rainfall and reduces the over all availability of water in shared rivers. The unique role of the Tibetan plateau and China's control of the headwaters of several rivers crucial to Asia constitutes an important part of the book's analysis of the growing potential for discord.
The book also deals with shared water resources on India's western side, with Pakistan, and the growing conflict over that sharing under the Indus Waters Treaty. At the time of Partition, the British gave the three western rivers of the Indus river system (Indus, Jhelum and Chenab) to Pakistan and the three eastern rivers (Ravi, Beas and Sutlej) to India. According to Chellaney, India has failed to address this source of tension.
Chellaney describes the impact of the destructive use of natural resources, including water, in Asia's rapid quest for double digit economic growth and how this is laying the ground for strategic shifts in Asia's water politics, creating even greater potential for water wars between countries.
The increasing demand for water to grow more food for the densely populated countries of Asia, particularly China and India, is already causing upheavals in water sharing agreements. Both China and India are shown to be the victims of their earlier legacies of water use.
Mao Zedong made grandiose plans for mega projects to divert water from the water rich south of China to its arid north and built huge dams on its rivers so that today China has the largest number of dams in the world. This includes the highly contentious Three Gorges Dam which has wrought environmental destruction on an unprecedented scale. The over damming of rivers has interfered in their flows, leading farmers to turn to groundwater, causing its overexploitation and pollution of aquifers.
In a different way, Chellaney says that India's negligent and disjointed approach to water management has also created a water crisis. Constitutionally water was made a state subject (rather than a central one, which would allow easier regulation) so that today states that share rivers are perpetually entangled in water disputes. Similarly, the Indus Treaty with Pakistan (1960), according to which India committed to indefinitely reserve 80 per cent of the Indus waters for Pakistan, reflects a lack of foresight and understanding of the role of water, especially for an agriculture dependent, food insecure country.

The book's most fascinating part is where it lays out the position and politics of Tibet as an enormously rich source of natural resources, especially minerals, water and biodiversity. China's annexation of Tibet and the brutal measures it takes to subjugate this rich land and its gentle people, is to be seen in the context of its determination to exploit Tibet's vast mineral resources and its water for hydropower and irrigation, even as it destroys its unique, often unparalleled biodiversity. Having

brought its own water resources under severe stress and caused irreversible contamination in many parts, China is now seeking to conquer the waters of Tibet. It is pursuing major water projects like inter river transfers in the fragile ecosystem of the Tibetan plateau.
Tibet qualifies as a world heritage site on account of any one of its many aspects, its irreplaceable biodiversity, its landscape with deep gorges and canyons, its unique systems of agriculture and the culture of its people. Chellaney's description of the desecration of Tibet by China is heartbreaking Water: Asia's New Battleground is a comprehensive and interesting book but it could have paid greater attention to suggesting what India could propose to mitigate the potential water conflict with China; what negotiating positions could it put on the table? What counter-measures could it take to protect its interests? How, for instance, could the two countries take advantage of each other's strengths so that there is more to be gained from cooperation than conflict?
Both countries, but especially China, have experience with micro hydropower projects. Local communities in the Himalayas and in Tibet have a tremendous knowledge of biodiversity, hydrology and efficient water use, as well as water conservation. Sharing this knowledge could build bridges of mutual benefit and provide a stake in collaborating. So far, collaboration and coordination between the two countries in dealing with environmental challenges has been limited, despite several signed agreements. In 1993, China and India signed a collaboration agreement on the environment and more recently they have signed an agreement to jointly monitor glaciers and work together in the areas of energy and afforestation. Suggestions on taking such beginnings forward would have added value to this book.

"Water wars & boiling points", 11/12/2011, online at: http://www.asianage.com/books/water-wars-boiling-points-679

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❖ Middle East logistics firms require 'green' support

As representatives of the world's governments, international organisations and civil society wraps up the United Nations Climate Change Conference, experts are calling on regional governments to pass regulations persuading logistics firms to build sustainable practices into their operations.

In what was viewed as an interesting backdrop to the international conference, logistics, customs, and corporate supply chain experts attending the closing ceremony of the 2nd Annual Global Logistics Forum held in Abu Dhabi in November, unanimously agreed on the importance of employing sustainable and green practices in logistics operations throughout the region.

But contrary to past practices of firms shouldering the responsibility of implementing such a programme, experts at the event called on governments to pass regulations that would assist firms in initiating sustainable practices.

According to Dr. Frank Straube, managing director, TU Berlin Chair of Logistics, even with the tremendous pressure clients and stakeholders exert on logistics companies to go green, they might still find difficulties in implementing sustainable practices as there are no set standards on how to apply them.

"Human morality won't solve the problem of global warming, so governments have started issuing regulations and laws that will prevent any further increase of CO2 emissions in certain industries," said Dr. Straube.

"It is now our international responsibility to assess our methods and try to reduce the carbon footprint of the logistics industry within the region and perhaps one method to achieve the desired result is to encourage governments to re-evaluate how wealth is measured and find a correlation between the GDP and CO2 emissions."

Although some Middle East countries are not currently bound to GHG emissions reductions by the Kyoto Protocol, the region may be prone to significant impacts from rising global temperatures, including intensified desertification and water scarcity.

Contrary to belief that green initiatives are expensive to implement, Dr. Walid Fayad, partner at consultancy firm Booz & Company, has commented that regional governments which take a positive approach to GHG management can extend benefits beyond profit.

"Middle East logistics firms require 'green' support", 11/12/2011, online at: http://www.arabiansupplychain.com/article-6862-middle-east-logistics-firms-require-green-support/

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❖ Africa: Water Fuelling Western Military Adventures

It is becoming increasingly accepted that water promises to be to the 21st century what oil was to the 20th century: the precious commodity that determines the wealth of nations.

Western military intervention in Iraq, Libya and imminently Syria is driven as much by a thirst to profit from water as it is by a desire to pilfer oil, trade arms and gain lucrative no-bid reconstruction contracts.

The military invasions are ostensibly aimed at liberation. But the corporate invasion that follows is about liberalisation not liberation.

British Defence Secretary Philip Hammond recently let the cat out of the bag by officially confirming that Britain will make returns of £200 billion from reconstruction contracts in Libya, all from a mere £300 million investment.

According to the US based Centre for Public Integrity western nations stand to make up to a US$1trillion from privatising, harnessing, purifying and distributing water in a region where water often sells for far more than oil.

Although over two thirds of our planet is water, we face an acute water shortage. This scarcity flies in the face of our natural assumptions. Roughly 70% of our world is water but the problem is that 97% of that is salt water.

Great for fish, not so good for humans. Of the world's fresh water, only 1% is available for drinking, with the remaining 2% trapped in glaciers and ice.

Put differently: if all the water on earth were represented by an 11 litre jug, the freshwater would fill a single cup and all we can access would be the last drop.

Increasingly, for water to be useful, it needs to be mined, processed, packaged, moved and delivered. Just like gold, coal, gas or oil. However, unlike oil, there are no substitutes, alternatives or stopgaps for water.

Nature has decreed that the supply of water is fixed.

All the while demand rises inexorably as the world's population increases and enriches itself. Climate change, population growth, pollution, urbanisation and the rapid development of manufacturing industries are relentlessly combining such that demand will outstrip supply by 40 per cent by 2030.

Several months prior to the invasion of Iraq the CIA raised the spectre of hydrological warfare "in which rivers, lakes and aquifers become national security assets to be fought over, or controlled" through proxy armies and client states.

On April 17, 2003, in Iraq, the American company

Bechtel received a no-bid reconstruction contract from US Agency for International Development (USAID). The initial contract was for US$680 million over 18 months. It now stands at over US$100 billion.

Thus making it the largest Iraq reconstruction contract. The most lucrative Iraq reconstruction contract was not to repair oil infrastructure, build schools and hospitals or repair bombarded infrastructure. It was to source, process and distribute water.

The secretive, opaque and no-bid nature of the water contract award process is made even worse by one incredible fact. Bechtel has botched many of its previous projects.

In California, Bechtel installed one of the nuclear power plant reactors backwards. In Boston, what promised to be a US$2.5 billion job for an infamous tunnel became the most expensive in US history costing US$14.6 billion. The tunnel project was plagued by charges of poor execution, corruption, criminal arrests and even four deaths.

In Bolivia, Bechtel's record is one of privatising water, jacking up prices by 35 per cent; thereby causing riots in which several people died; getting kicked out and suing the Government for cancelling the contract.

Since the turn of the century Iraq was the first casualty of hydro-imperialism and Colonel Gaddafi's assassination marks the second. At this very moment Colonel Gaddafi's dictatorship is being dismantled and replaced by a corporate dictatorship.

At the forefront of this new order are France's global mega-water companies Suez, Ondeo and Saur, who control almost half of the world's water market. These multinationals are rushing to privatize water, already a US$400 billion global business.

They now stand to rake in billions of dollars from the eighth wonder of the world the - the Great Man-made River scheme (GMMR).

This scheme was the brainchild of Colonel Gaddafi and was set to turn Libya a nation that is 95% desert into a food self-sufficient arable oasis. The GMMR is a $25 billion Nubian Sandstone Aquifer, which is an immensely vast underground sea of fresh water. It has a complex 4 000km long water pipeline buried beneath the desert that could transport two million cubic metres of water a day.

Mr. Gaddafi had intended the scheme to be designed by Libyans, constructed by Libyans, for the benefit of the Libyan population. Now it will almost certainly be redesigned by Frenchmen and women at inflated costs, constructed by French contractors, largely for the benefit of French shareholders. Libyan taxpayers will be stuck with the bill and higher water bills.

For western leaders, the corporations that fund their political campaigns and the Jewish lobby that is the backbone of corporate America, intervention in Syria however is not exclusively about profit. It is about something far more important - Israel.

Israeli leaders assert that Mr. Assad poses an existential threat to Israel on two fronts. For a start, Syria backs insurgents and radicals in Lebanon, Palestine and Iraq, and foments Iran's belligerence.

More importantly, Mr. Assad posses a bigger threat to Israel's existence on the issue of water. Not least because Mr. Assad has vowed to reclaim the Golan Heights a strip of land which Israel captured from Syria in the war of 1967.

The Golan Heights provide a staggering 40 per cent of Israel's fresh water.

"Syrian control of half of our water poses more of a threat than Iran with one bomb" once remarked ex Israeli intelligence head Meir Dagan. Mr. Assad has also been reticent to privatise the water industry and expose the population to predatory pricing. Thereby preventing the west from tapping into a multi-billion dollar revenue stream.

Mr. Assad's refusal to play ball on water privatisation and his choice to play hardball over the Golan Heights mean that the Syrian President - like Mr. Hussein and Colonel Gaddafi before him is an obstacle to the west's hydro-imperialist agenda. Hence the recent calls that " Mr. Assad has lost all legitimacy and must step down immediately."

Since the turn of the century, western military adventures in the Middle East have undoubtedly been fuelled by billions of dollars in profit from pilfering oil, trading arms and winning no bid reconstruction contracts.

Whether its preserving almost half of Israel's water supply, controlling the eighth wonder of the world or awarding oneself the biggest reconstruction contract in Iraq, water has also been a key part of the blend that has fuelled the west's war-machine.

Control of nature's most precious and increasingly valuable commodity will, for any nation, spell the difference between greatness and decline. Mr. Hussein, Colonel Gaddafi and a defiant Mr. Assad know that all too well.

“Africa: Water Fuelling Western Military Adventures”, 05/12/2011, online at:
http://allafrica.com/stories/201112050242.html

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❖ Laos to Delay Xayaburi Dam on Mekong, Seek Further Studies

Dec. 8 (Bloomberg) -- Laos agreed to delay construction of a $3.7 billion hydropower dam on the Mekong River because of concerns among neighboring countries that the project would disrupt fisheries and rice production downstream.

Laos, Cambodia, Vietnam and Thailand will approach the Japanese government "and other international development partners to support the conduct of further study," according to a joint statement after representatives met in Siem Reap, Cambodia today.

"Laos to Delay Xayaburi Dam on Mekong, Seek Further Studies", 08/12/2011, online at: http://www.businessweek.com/news/2011-12-08/laos-to-delay-xayaburi-dam-on-mekong-seek-further-studies.html

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❖ Water Dilemma

Water scarcity is for many the biggest challenge facing Africa's agricultural development. However, a major study from the Consultative Group on International Agricultural Research has shown that the developing world's largest river basins have the water resources to accommodate a doubling of food production this century. It is water management, and not water scarcity, that is hindering the expansion of agriculture, according to Dr. Simon Cook, from the International Center for Tropical Agriculture, who led the research.

The Nile, Ganges, Andes, Yellow River, Niger and Volta are all capable of feeding breadbaskets on their respective continents.

"What's stopping it being exploited? Well, everything," he says. "In Africa, there are many factors constraining improvements in productivity. It goes from lack of access to inputs, lack of access to finance, lack of stability of tenure and landholding arrangements, lack of access to markets, lack of infrastructure. Basically, a broad, systemic failure that requires a systemic approach to solve it."

However, the systemic underinvestment in rain-fed agriculture, and a focus on irrigation, which, while effective, is costly and reaches far fewer farmers, has curtailed growth in these river basins, according to Dr. Cook.

"It's easy to focus on investments in irrigation than it is to focus on more broader systemic and political changes that underwrite the rain-fed system," he says. "The problem is it's a lot easier to invest or focus on specific schemes than it is to invest in longer term institutional development."

Institutional weakness is a persistent problem in many African countries, and many other developing world nations. However, there are examples where long term planning has led to successful management and huge productivity increases. "One exception would be Brazil, which took a long-term systemic approach to developing agriculture," Dr. Cook says. "OK, there may be some questions about its ecological sustainability, but they took a long-term approach and created an agricultural revolution in 20 years."

"Water Dilemma", Peter Guest, 06/12/2011, online at:
http://online.wsj.com/article/SB10001424052970204485304576643060168651714.html?mod=googlenews_wsj

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❖ Decision Looms on First Mekong Mainstream Dam

BANGKOK (AP) — Impoverished Laos is poised to erect the first dam across the Mekong River's mainstream as it pursues its goal of being Asia's battery despite intense opposition from downstream countries and environmental groups.

In what has become Southeast Asia's biggest environmental battle, opponents say the dam in central Laos would open the door for a building spree of many as 10 others on the Mekong in Laos and Cambodia, degrading its fragile ecology and affecting the livelihoods of millions of residents.

A regional river management forum is expected Thursday to approve, reject or postpone a decision on the $3.5 billion Xayaburi dam during a meeting in Cambodia of four Southeast Asian nations through which the mighty, 3,000-mile-long (4,900-kilometer-long) river flows.

However, there are signs that Laos is prepared to go ahead with the project with or without the Mekong River Commission's approval — since the decisions are not legally binding — raising questions about the effectiveness of a 15-year project to jointly manage the river.

Laos says it wants to win its neighbors' approval, but companies have already begun working on an approach road and other dam-related facilities, stating that it will "make sure that this dam will not impact countries in the lower Mekong basin."

The dam decision may be the single biggest challenge the Mekong River Commission has faced.

Meeting in April, representatives of Laos, Cambodia, Vietnam and Thailand agreed to defer decision in face of rare disagreement between Laos and its communist neighbor Vietnam as well as protests by nongovernment groups and villagers living along the river.

Vietnam has urged at least a 10-year moratorium on all mainstream dams on the Mekong.

The Switzerland-based World Wide Fund for Nature said this week that a consulting firm which recommended proceeding with the dam was "playing roulette with the livelihoods of over 60 million people."

But landlocked Laos is banking on hydropower, one of its few major resources, to become what it calls the "battery of Asia" and to lift it from the ranks of the world's poorest nations. Thailand agreed last year to buy 95 percent of the electricity output from the 1260 megawatt dam.

Laos has not announced how much revenue it expects from Xayaburi, but its biggest existing dam, Nam Theun 2, which began operation last year, already is projected to earn up to $2 billion over the next 25 years.

The Finnish consulting firm Poyry, hired by Laos earlier this year, concluded that country had properly addressed concerns about the dam's ecological impacts but that more data was needed on fish migration, restoring livelihoods of river residents and other issues.

The World Wide Fund for Nature blasted Poyry for clearing the project while admitting serious data gaps.

The dam would cut across a stretch of the river flanked by forested hills, cliffs and hamlets where ethnic minority groups reside, forcing the resettlement of up 2,100 villagers and impacting tens of thousands of others.

Environmentalists say such a dam would also disrupt fish migrations, block nutrients for downstream farming and even foul Vietnam's rice bowl by slowing the river's speed and allowing saltwater to creep into the Mekong River Delta.

China has placed three dams across the upper reaches of the Mekong and more are planned, but otherwise the mainstream flows free. These dams continue to anger downstream villagers, who maintain fish stocks have plummeted dramatically and riverside farms have suffered.

But building the first dam blocking the mainstream of the Mekong would have far greater consequences, environmental groups warn.

"The Xayaburi Dam will irreparably damage the world's largest freshwater fishery," Aviva Imhof of the US-based International Rivers said in an interview. "The dam will block fish migrations, cause the extinction of threatened species such as the Mekong Giant Catfish, and threaten the livelihoods of hundreds of thousands of people who depend on fisheries for food and income."

Laos insists the dam won't have any significant impact, describing it as the Mekong's "first environmentally friendly hydroelectric project."

"We will continue to convince Mekong River Commission members before going ahead with construction of the dam," Laos Deputy Energy Minister Viraphon Viravong said in an interview with the semi-official Vientiane Times on Monday.

The commission, set up in 1995, has expressed serious reservations about the Xayaburi project but has no final say despite Thursday's meeting in Siem Reap, Cambodia.

The commission has been criticized for producing little but talk and reports while the Mekong deteriorates. But proponents argue that by bringing the four countries together and trying to build consensus, it has so far put the brakes on mainstream dams.

The commission also is handicapped by the reluctance of Mekong nations China and Myanmar to take part.

Laos has the right to proceed on its own, but the poor country would prefer its neighbors' support, especially that of Vietnam, which is a major trading partner and political patron and which has criticized the plans.

The U.S. government also has weighed in, citing concerns over environmental degradation and challenges to food security. When a decision on the dam was postponed in April, U.S. Secretary of State Hillary Rodham Clinton praised Laos as taking a "forward-leaning position."

"Decision Looms On First Mekong Mainstream Dam", Denis D. Gray, 07/12/2011, online at: http://www.salon.com/2011/12/07/decision_looms_on_first_mekong_mainstream_dam/

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❖ 4-nation Mekong security patrols begin

BEIJING (AP) — China says its armed police began joint Mekong River security patrols on Saturday with forces from Myanmar, Laos and Thailand, a development likely to deepen Beijing's influence in an unstable region on its southern flank.

The patrols are a response to the deaths of 13 Chinese sailors who were attacked on two cargo ships in early October along the Thai section of the river that flows through the lawless Golden Triangle region.

The joint operations among the four nations will take Chinese vessels downstream over the border, a first for Chinese border police. China has long contributed police to United Nations peacekeeping missions overseas, but this is believed to be the first time they will work in another country's territory without a U.N. mandate.

The official Xinhua News Agency reported Saturday from Xishuangbann in Yunnan province near the borders with Laos and Myanmar that the patrols had begun.

The patrols reflect how Chinese political influence is accompanying the country's economic penetration of the region, particularly in the impoverished nations of Laos and Myanmar.

That doesn't come without political risk for Beijing, however, with many of its neighbors already wary of Chinese domination. China's military strength and willingness to assert its territorial claims have prompted many to seek stronger ties with the United States, which is focusing again on the Pacific as military operations in Iraq and Afghanistan are ending.

While Beijing has long provided key diplomatic and economic support for Myanmar, relations have been strained by fighting between Myanmar's army and rebel groups that has sent refugees into southwestern China.

China was also caught off guard by the suspension of a major dam project being built by a Chinese company in Myanmar that presaged a significant about-face in Myanmar's domestic politics.

Overall, the joint patrols should be positive for relations among the four and will have little real effect on the balance of influence, said Zhao Gancheng, director of Southeast Asian studies at Shanghai's government-run Institute of Foreign Studies.

"China is already the most influential country in the region and it's not necessary for China to gain more influence," Zhao said.

Little is known about the scale of the planned operations on the Mekong and it remains unclear how far south on the river they will go.

The Chinese leadership appears to be well aware of sentiments to its south, and Deputy Public Security Minister Meng Hongwei on Friday told the participating troops they must be respectful and

mindful of foreign ways and win the support of commercial shippers and people living along the river.

"Let joint law enforcement become the bond of friendship between the people of the four nations and the officers and men taking part be ambassadors of friendly exchanges with the outside," Meng said in remarks at a ceremony marking the formal establishment of the Chinese patrol unit.

The Chinese force is made up of more than 200 officers and men drawn from border patrol units along China's coast and major rivers. They will sail in 11 converted flat-bottomed passenger and cargo ships based in the Mekong River port of Guanlei on China's border with Myanmar, also known as Burma.

State broadcaster CCTV ran footage showing the troops drilling on board a ship with the latest models of Chinese assault rifles.

"It's the first time in the history of Chinese border guarding to go abroad to another country to jointly enforce the law. This is a groundbreaking model of a police cooperation mechanism," the force's political commissar, Liu Jianhong, told CCTV.

In addition to the patrols, China will host a multinational Mekong River security headquarters at Guanlei staffed by officials from the four countries. China has also offered to dispatch experts to help train security personnel in Myanmar and Laos.

Sailors shipping Chinese manufactured goods and agriculture produce downriver have long complained of armed gangs that loot their boats or demand cash. But little action was taken to protect them until the Oct. 5 attack near the Thai-Myanmar border that sparked Chinese demands for a thorough investigation.

Drug smugglers were initially suspected, but nine Thai soldiers later surrendered.

Meng said criminal activity has grown along the river. Drugs are abundant in the Golden Triangle and public security is chaotic, he said.

While China has long eschewed overseas military deployments and alliances, its growing economic interests abroad have compelled it to reevaluate such notions. At the end of 2008, Beijing began sending naval vessels to take part in anti-piracy patrols in the Gulf of Aden off Somalia's violent, anarchical coast, helping to escort both Chinese ships and those carrying U.N. food aid.

As Libya descended into civil war this spring, the military dispatched a navy frigate and two transport planes to aid in the evacuation of the 30,000 Chinese working there.

"4-nation Mekong security patrols begin", 09/12/2011, online at: http://www.chron.com/news/article/4-nation-Mekong-security-patrols-to-begin-Saturday-2391286.php

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❖ Climate Change in West Africa: concern for regional stability

The report, led notably by the **United Nations Environment Programme (UNEP)**, combines analyses based on innovative mapping procedures and prospective endeavors, through recommendations to policy makers. It focuses on **17 West African countries situated between the Atlantic coast and Chad.**

Nineteen climate hot spots were detected first; areas where changes were most severe (temperature increase of over 1.5° C, with 2° C in Mauritania, in eastern Chad, and Northern Mali; increased rainfall; frequent droughts and floods).

This report also clearly **shows that these changes in conditions have affected the livelihoods of millions of people dependent on natural resources, especially the rarest resources in the region: water and arable land.**

However, **eve though regional governance is recommended, especially one that takes into account the trans-border aspects of the issue,** a direct link to conflicts is not stated per se. Rather, a constellation of factors is evoked, including **access to natural resources affected by climate change**. However, **competition for access to water and land is already underway in West Africa**, which legitimates the study's clear concern. The report calls for **major investments to help societies adapt to climate change** and reduce the risk of conflict and forced migration.

"Climate Change in West Africa: concern for regional stability", 08/12/2011, online at: http://www.fondationchirac.eu/en/2011/12/in-the-news-thursday-december-8-2011/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+fondationchirac_en+%28Fondation+Chirac+%28En%29%29

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❖ Desalination contract links Qatar and China into $8.3m agreement

DOHA, Qatar, Dec. 9, 2011 – Qatar Petrochemical Co. (QAPCO) has awarded a contract to Chinese firm Tri-Tech Infrastructure to deliver a 5,760 m^3/day thermal desalination unit for its Utility Plant at **Mesaieed Industrial City in Doha**.

Valued at $8.3 million, the contract will see Tri-Tech U.S. delivering its Multiple Effect Thermocompression (MED-TC) desalination technology and will include design, engineering, fabrication, commissioning and performance testing.

The contract forms Tri-Tech's first thermal seawater desalination contract in the **Middle East** and third contact outside China during 2011.

Phil Fan, co-president of Tri-Tech Holding, said: "**Qatar** has no natural waterways and scarcity in fresh water, so almost all potable water and industrial processing water is desalted seawater. Qatar plans to invest $75 billion in natural gas and petrochemical industries by 2012 and expects to upgrade its refining capacity to 18 million tons by 2016. Given the country's needs for fresh water for its people and industry demands for wastewater, water treatment and desalination, especially for use in the petrochemical sector, we will continue to enhance our marketing and sales effort in the Middle East."

Tri-Tech U.S. said it expects to deliver the desalination unit by November 2012 and that it will "operate efficiently at low temperatures to reduce scaling".

"Desalination contract links Qatar and China into $8.3m agreement", 09/12/2011, online at: http://www.waterworld.com/index/display/article-display/3790705100/articles/waterworld/world-regions/middle-east/2011/12/Desalination-contract-links-Qatar-and-China-into-agreement.html

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❖ USAID Co-hosts Water Conference in Oman

WASHINGTON, D.C. - A conference sponsored by the U.S. Agency for International Development and the Middle East Desalination Research Centre (MEDRC) launched December 5 in Muscat, Oman, with opening remarks from U.S. Ambassador to Oman Richard J. Schmierer and Dr. Mohamed S. Al Busaidi, Deputy Director General, Oman Ministry of Foreign Affairs.

The regional meeting of the Middle East and North Africa Network of Water Centers of Excellence (MENA NWC) has drawn over 70 water experts from national research entities from across the Middle East and North Africa and the United States. This initial group will undertake joint research on important water issues such as desalination and integrated water resource management.

The meeting of the new regional water network also launched Thematic Partnerships of research institutions and universities in the Middle East. These partnerships will address longstanding, critical water challenges in the MENA region through collaboration with governments, the private sector, and civil society organizations. The technical areas include efficient and productive use of water, ground water management, sanitation, non-conventional water and energy.

"USAID Co-hosts Water Conference in Oman", 06/12/2011, online at:
http://www.usaid.gov/press/releases/2011/pr111206.html

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❖ The First International Event to Bring Together the Water, Oil & Gas Industries

Water is becoming more and more valuable to the energy industry in terms of production levels, supply, treatment and environmental solutions. Oil and gas production in areas such as the Middle East and Central America will begin to decline with out sufficient water management causing catastrophic consequences not only to their countries but for the energy market.

Held at the Madinat Jumeirah – Mina A' Salam, Dubai and under the patronage of **HH Sheikh Mohammed Bin Maktoum Bin Juma Al Maktoum** the Global Water: Oil & Gas Summit will take place on 21-23 May 2012 and is the first international event of its kind to bring together senior decision makers in the water, oil and gas industries to discuss the role and demand for water in the oil and gas industry.

This strategic three day conference and workshop will look in-depth at the role of water in the production of oil and gas by bringing together industry experts to explain the growing demand and importance of the water industry and the need for collaboration.

Water is increasingly becoming a critical part of project planning for oil and gas refineries, with refineries creating vast amounts of contaminated water that can be managed in a number of different ways. **Zahra Al-Hammadi, belonging to the State Company for Oil Projects of Iraq** will share their experiences and highlight opportunities in the refining sector. Further to this a special address made by **Michael Flynn of NASA will** discuss the sustainability of water in drought affected oil and gas producing countries while explaining research results **NASA** has undertaken in this area over the past years.

With a number of water companies announcing new technologies to mitigate costs and risk associated with the treatment of water within the oil and gas industry, **Dr Zara Khatib** of **Shell International E&P** will explain how these can be integrated and benefit the oil and gas industry economically.

Day two of the summit will conclude with a round table discussion session led by The International World Water Council on training and synergy for engineers in water, oil, gas and the need for collaboration between the industries.

Key support to date for this international summit includes; The International World Water Council, Global Water Intelligence, Veolia Water Solutions and Technologies, VWS Oil and Gas and CH2MHILL.

"The First International Event to Bring Together the Water, Oil & Gas Industries", 07/12/2011, online at: http://www.oilvoice.com/post/Company_News_Release/The_First_International_Event_to_Bring_Together_the_Water_Oil_Gas_Industries/46968fc066.aspx

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❖ Predicting Future Aquifer Behaviour Down Under in Australia

Although Australia is one of the driest countries in the world, its groundwater has been "neglected, undervalued and poorly understood". A five year research programme, involving a centrifuge facility allowing researchers to effectively speed up time, aims to predict aquifer contaminant behaviour. The NCGRT provides an update on the project.

Beneath the red and black dirt that covers much of Australia - located in the second driest continent on the planet - lies vast reserves of underground water, the secrets of which researchers are hoping to unlock. Groundwater is a vital resource that comprises 30% of the country's total water consumption.

These underwater reservoirs are the largest source of fresh water in what is a hugely arid continent – they hold enough water to fill all of Australia's dams or the iconic Sydney Harbour many thousands of times.

They are regularly refreshed by floodwaters that seep into the earth and are stored and transmitted through a system of confined aquifers, permeable rock formations that lie deep underground, overlain by aquitards - relatively impermeable rock or clay that limits groundwater movement into, or out of, the aquifer. The Great Artesian and the Murray Darling Basins are crucial to ensure the future of Australia's population, but human activity such as coal seam mining and irrigation may impact on these water resources.

A five year project on aquitard research by Australia's National Centre for Groundwater Research & Training (NCGRT) is halfway through and aims to ensure the future of Australia's groundwater resources. Researchers at the University of NSW (UNSW) node of the NCGRT are hoping to better understand long-term effects of both natural events and human intervention on this vital resource, and are being helped by a state-of the art centrifuge permeametre facility, allowing them to "speed up time".

This facility will allow researchers to study the movement of water and contaminants through the aquitards. By subjecting samples of aquitards, as well as "cap rocks" which sit above some aquifers, researchers will be able to determine how much water or contaminant will move into or out of an aquifer once it is disturbed by drilling or pumping bores.

Professor Ian Acworth, who is joint leading the project, says: "It's basically like a time machine – you speed up gravity about 300 times beyond normal and that in turn speeds up the response of the aquifer to events such as water extraction and dewatering."

Professor Acworth says centrifuge testing could be included in environmental assessment processes for coal bed methane extraction and coal mining. This would give a clear indication of which aquifers are suitable for mining operations and which are vulnerable to compromise of water reserves. The research, centred around the Namoi catchment area of the Murray Darling Basin, which is around 400 kilometres north-west of Sydney, is part of the wider vision to improve Australia's understanding and management of critical groundwater resources.

Focused on relatively shallow aquifers to about 40 and 80 metre depths, the water contained within these gravel and sands are critical for irrigation and town water supplies.

Researchers have identified several key research focuses and consider this a high priority given that the lack of knowledge of the moisture content, storage, hydraulic conductivity and water quality of the many aquitards in Australia is a major threat to groundwater resource security. Over very long time scales, the diffusional losses evident in many aquitards mean that they also play a vital role in aquifer water quality.

Given how deep underground this complex system of aquifers and aquitards lies, and its vast geographical footprint, it has been difficult in the past to visualise exactly how it works, and what impact human intervention has had on the future of this vital groundwater reserve.

It is evident that should groundwater extraction exceed recharge, aquifers will be depleted. This, in turn, will threaten Australia's efforts to manage stressed surface water resources, with adverse consequences for communities, agriculture and industry. It will also reduce the river flows needed to sustain groundwater-dependent ecosystems such as wetlands and some riparian forests.

Led also by Dr Wendy Timms, an integral component of the UNSW aquitards project is to better understand what effect activities such as irrigation and coal seam mining will have on the future of the basin. As more water is taken out of aquifers for these purposes, the aquifers can depressurise. This means they may compress and compact and the aquitards above them may subside.

Dr Timms says coal bed methane built up underground where "disconnections" – barriers such as clay or rock that obstruct the natural flow of water or gas – occurred.

"The key question is how the degree of connection might change when groundwater pressures change as a result of drilling and the centrifuge will help us understand that," she says.

Centrifugation could study geological media in saturated, unsaturated and variable saturation state and help bridge these gaps. It is expected that centrifugation can also directly address questions of sub-surface flow at scales that are not otherwise possible. For example:

- Time scales – By quantifying flow processes that occur over decades and centuries in the environment, centrifuge models can simulate flow over thousands of years within a reasonable experimental time frame of weeks or months. It can also provide realistic measurements and observations to support numerical modelling of very long term processes that occur in the sub-surface (for example, hydraulic responses in sedimentary basins over millennia)
- Spatial scales and heterogeneity - Small centrifuge models can simulate thick geological media or replicate numerous permeability type tests to assess spatial heterogeneity. Studies of leakage through aquitard windows has for example identified pathways on a scale of metres and tens of metres as being critical, yet unquantified in groundwater systems. Scale modelling of complex groundwater systems in a centrifuge tank provides this capability

- In-situ stresses - Centrifugation enables testing of geological media at in-situ stresses that occur at depth of burial. This capability is particularly important for compressible media such as clay aquitards
- Direct observation of physical processes - Centrifugation can obtain realistic input data for numerical modelling by direct observation and measurement performed in flight. Development of techniques such as centrifugation has lagged considerably behind complex numerical modelling and computing power.

The centrifuge facility, and the research undertaken there, forms the basis of a sub-program within one of the NCGRT's five core programs. This includes the first program, entitles "Innovative characterisation of aquifers and aquitards", directed at overcoming major inadequacies in available hydrogeologic conceptualization and field measurement methodologies.

While centrifugation is an accepted technique in geotechnical engineering, it remains largely unexplored in hydrogeology. This facility recognises and appreciates the power and utility of centrifugation within the water resources and hydrogeological profession. Researchers hope the facility will address a critical gap in knowledge between soil science and hydrogeology. WWi

“Predicting Future Aquifer Behaviour Down Under in Australia”, 08/12/2011, online at: http://www.waterworld.com/index/display/article-display/5288177525/articles/water-wastewater-international/vol-26/issue-5/editorial-focus/groundwater-development/predicting-future-aquifer-behaviour-down-under-in-australia.html?cmpid=EnlWaterWorldInternationalDecember82011

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❖ Falling Blue Gold Helps Urban Africa's Water Supply

Although not renowned for high levels of rainfall, Ethiopia and Tanzania have proven through recent trials that rainwater harvesting can provide a supplementary source of water supply in urban Africa. Tekalign Tsige Sahilu discusses results from the trials and considerations for future rainwater harvesting efforts in Africa.

The world has recognised the growing global water scarcity experienced in many countries. The situation demands improved management of available water resources and promotion of freshwater augmentation technologies. In particular, an increased application of rainwater harvesting technologies has the potential to become an important alternative source of water for domestic water supply and sanitation.

UN-Habitat, the United Nations Programe for Human Settlements, has recognised the need to promote rainwater harvesting in urban areas of Africa. This forms part of the Water Demand Management component of the Water for African Cities programme. Consequently, efforts are underway in several countries to promote this technology.

Demonstration of rainwater harvesting in African urban centers

As part of the Water for African Cities programme, UN-HABITAT and local NGO, Ethiopian Rainwater Harvesting Association (ERHA), together with the government entity known as Zanzibar Water Authority (ZAWA) formed partnerships for the planning and the implementation of a rainwater harvesting pilot project in Ethiopia and Zanzibar respectively.

The pilot programmes were carried out in three cities of Ethiopia (Addis Ababa, Dire Dawa and Harar) and in Zanzibar (Unguja and Pemba islands). Simple techniques such as fero-cement or plastic tanks were used for collecting and storing rainwater from rooftops.

Rainwater harvesting schemes were demonstrated in 13 schools, four community centers and two prisons, reaching over 22,000 clients. A total of 24 rainwater harvesting schemes with the capacity ranging from 5 m^3 of plastic tanks to 50 m^3 of fero-cement tanks were constructed. Overall water collection capacity of the 24 tanks is estimated to be 550 m^3, translating into a per capita yield from rainwater of about 25 litres.

From the point of view of the current practice of water use in the project countries, 25 litres water per capita is sufficient to meet the demand of the residents during the rainy season.

The physical construction of the rainwater harvesting schemes was supported through training and capacity-building activities. Accordingly, training manuals and technical guidelines were developed and promotional and reference materials on relevant topics produced and distributed. Rainwater management committees were formed and trained in regard to operation, maintenance and management of the schemes.

Impacts

One of the most immediate outcomes of the demonstration project was an increase in demand for rainwater harvesting services. This resulted in an initiative taken by the relevant government departments of the participating cities, whom later earmarked a budget for the implementation of rainwater harvesting schemes. Such intervention has also inspired utilities to consider rainwater harvesting as a complementary source of water, particularly Harar and Zanzibar.

In terms of potential long-term impacts, it can be expected that the up-scaling of the programme will enable the use of rainwater as an adequate potential water resource, which has not been properly used so far and previously wasted due to unchecked runoff.

In countries like Zanzibar, the growing water demand will create more pressure on groundwater resources, resulting in increased abstraction of groundwater and hence the intrusion of seawater into groundwater. Therefore, up-scaling rainwater harvesting in Zanzibar will help to reduce reliance on groundwater sources and mitigate against this problem.

In addition, the promotion of rainwater in schools and similar institutions can help to reduce costs either through the reduction of the values of water bills or the saving of electric power that is used to pump water from wells.

Changing perceptions about rainwater quality

So far, water and sanitation policies of many African countries have completely ignored rainwater harvesting as a potential supplementary sources for the urban water supply system. In some cases, rainwater harvesting is used as a suitable technology for rural communities. However, the absence of effective policies for rainwater harvesting as a complementary source of water for domestic use is and will continue to be a challenge for the promotion of the rainwater harvesting programme.

There are also cultural taboos or religious beliefs that have a negative impact on the use of rainwater. A typical case is considering rainwater as having negative effects on the health of women (as encountered in Zanzibar).Also the practice of not paying for water or getting water from the system free of charge may not encourage people to look for an alternative source. In Zanzibar, residents were used to not paying for water for a long time, which can considered as one of the factors hindering the wide-spread use of rainwater in the country.

At the individual household level, promoting rainwater collection can also be constrained by the fact that the installation costs of the technology can be relatively higher than that of the cost of constructing a private line to the network system. Generally, there is always a concern about the quality of rainwater. Therefore, there is a lack of full confidence to tell residents to use rainwater for drinking purposes.

The storage capacity of rainwater tanks remains a concern when considering water needs over a long duration of time. During the implementation process of the programme, it was also observed that the design of some school buildings is not suitable for the installation of rainwater harvesting facilities.

Rainwater for secondary needs

To make the promotion of rainwater harvesting effective, the demonstration of the physical work has to be combined with awareness raising, educating the public and facilitating stakeholders' networking.

The rainwater harvesting system has been found to be practically suitable for elderly and disabled people who do not have private water connections nearby their homes. Since these residents are not able to walk long distances to fetch water, they need a technology that fulfills the "water without walking" principle. Therefore, rainwater harvesting is a highly suitable technology especially for elderly and disabled people.

Unlike groundwater extraction, the use of rooftop rainwater harvesting does not require energy or an electric power supply. This represents an economic and social benefit to a country like Zanzibar where the electric power supply is a scarce resource with substantial opportunity costs.

Potential savings can also be made by installing rainwater harvesting systems in large buildings such as schools due to their larger roof areas and their high demand for non-potable water. Intended to augment water demand management in urban areas, urban rainwater harvesting might not necessary be considered for potable purposes.

However, its suitability for other, secondary needs like laundry, sanitation, gardening, car washing, toilet flushing and personal sanitation can substantially reduce the use of treated (pipe water) otherwise consumed for those purposes.

Emergency response to water demand

Promotion of urban rainwater harvesting can tangibly contribute to water demand management and represents a sustainable approach to water supply. The rainwater harvesting demonstration project can be regarded as a rapid emergency response to the critical situation of countries like Zanzibar, particularly from the point of view of the water supply crisis suffered due to power interruption.

Providing schools with rainwater harvesting schemes improves hygiene and sanitation conditions and the implementation through schools has proved to be effective in reaching the community at large. It is also easer to show the economic benefit of using soft water (rainwater) than hard water (groundwater) since it is associated with lower consumption of detergents or cleaning substances.

Recommendations

The promotion of rainwater as an alternative source to address the need of urban domestic supply requires a suitable environment and buildings, as well as different development companies to oversee projects and interest at local, national, regional and international levels. Recommendations for future rainwater harvesting projects include:

a) Policy, strategy and programmes:

- Promote or facilitate dialogue with national governments to address rainwater harvesting in their policies
- Integrate rainwater harvesting mechanisms in schools and community development programmes
- Encourage utilities to incorporate rainwater harvesting in existing programme activities.

b) Community participation:

- Involve the community and other stakeholders from the inception phase.

c) Up-Scaling:

- Extend support for demonstration of rainwater harvesting through available financial resources for follow-up investments
- Increase the capacity of storage tanks to accommodate sufficient water that can last for a longer period of time
- Integrate demonstration programmes in other areas like health, community and religious centers.

d) Research and capacity-building:

- Facilitate platforms for sharing experiences and learning about best practices from others in the region
- Study and implement direct and indirect incentives to be provided for communities/institutions/households with rainwater harvesting
- Explore technologies that can be easily adapted to the local situations of African cities and ensure the quality of the rainwater
- Carry out cost-benefit analysis to show the comparative advantage of the technology over the others
- Establish financing mechanisms that will take into account the willingness and ability of the urban poor to pay for services
- Supporting the initiative through training and capacity building activities
- Supporting research on rainwater quality, quantity, affordability and sustainability. WWi

"Falling Blue Gold Helps Urban Africa's Water Supply", 08/12/2011, online at: http://www.waterworld.com/index/display/article-display/3494433486/articles/water-wastewater-international/vol-26/issue-5/editorial-focus/rainwater-harvesting/falling-blue-gold-helps-urban-africas-water-supply.html?cmpid=EnlWaterWorldInternationalDecember82011

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❖ A drought of ambition over Britain's water crisis

A White Paper recommending the overhaul of our water management is perhaps not ambitious enough.

With much of the country battered by a fierce winter storm, yesterday was probably not the most propitious moment to focus the country's attention on another potential crisis: a shortage of water. So used have we become to plentiful amounts of rain that to be told we must learn to cope with dwindling water supplies into the foreseeable future seems fanciful, even scaremongering. Yet the White Paper published by the Government yesterday, Water for Life, makes a compelling case for a complete overhaul of how we should manage this most precious of resources if we are to avoid serious problems.

This year, large parts of the country have received only 70 per cent of their average rainfall. The last 12 months have been drier than 1976, 1934 and 1921 – the worst drought years of the 20th century. Farmers, especially in eastern England, have been badly affected. Last week, the Environment Agency warned of drought conditions next year in central, eastern and south-eastern England – even if they have average levels of rainfall over the winter. A large part of the problem is that our current levels of water abstraction are simply not sustainable in the long run. It is always possible, given the vagaries of our maritime climate, that it will rain non-stop for the next six months, replenishing underground aquifers and topping up parched reservoirs. But even if it did, we would still be too profligate with our water.

What is needed is for all of us – water companies, businesses and consumers – to use supplies more efficiently. The White Paper goes a long way towards setting out how, relying heavily on market mechanisms. The proposals – some 22 years after the privatisation of the industry – would see the water companies' monopoly broken up and promote the entry of new suppliers. Farmers would be encouraged to set up their own reservoirs and trade abstraction licences. A new, more competitive retail market would be established in an effort to hold down rising prices, with greater incentives for metering.

These are good ideas – but perhaps not ambitious enough. After all, none will make much difference if there is not enough water, or if it does not get to where it is needed. The importance of greater interconnection in our water supply cannot be overstated. Some regions of the country have plenty of water, while others are drier than parts of the Middle East. After the drought of 1976, a water grid was proposed to move supplies around the country. While this is feasible as an engineering project, the White Paper argues that such large-scale transfer is currently too expensive. If we have many more years like this, however, it will be impossible to avoid.

"A drought of ambition over Britain's water crisis", 08/12/2011, online at:
http://www.telegraph.co.uk/comment/telegraph-view/8943849/A-drought-of-ambition-over-Britains-water-crisis.html

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