

ORSAM WATER BULLETIN

Weekly Bulletin by ORSAM Water Research Programme

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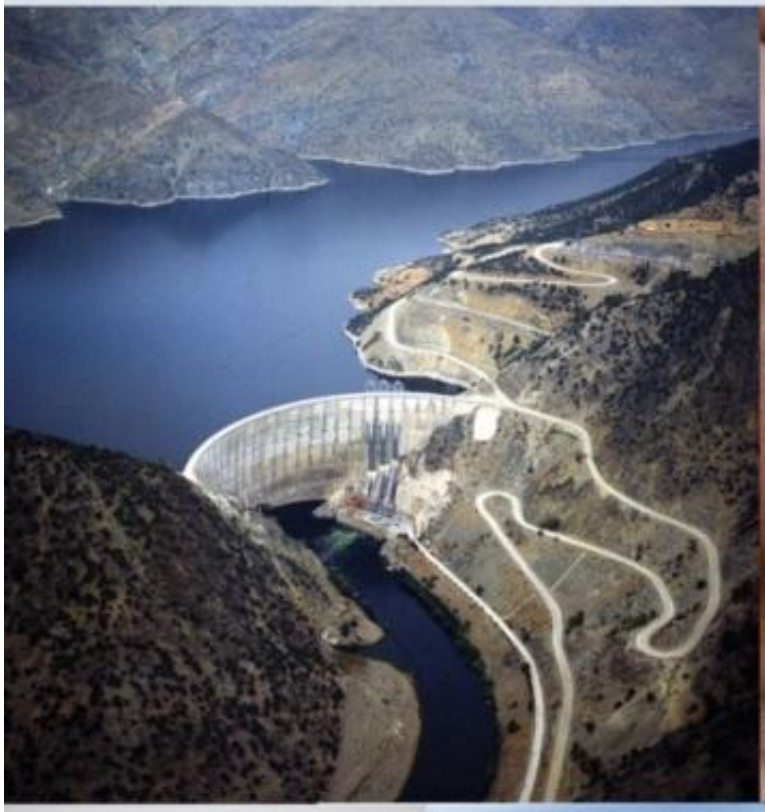



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❖ Turkey's agriculture sector hit by dry weather

Widespread drought is affecting Turkey's agriculture sector, with the 2014 wheat harvest at particular risk of underperforming and warnings of crop failures in a number of grain-growing regions.

One of Europe's largest wheat producers, Turkey harvested a record 22.1m tonnes in 2013, according to state statistics agency Turkstat. While much of this is for domestic consumption, Turkey exports to a number of countries both in the region and further afield, including to markets in Asia, with the Philippines and Indonesia among its major buyers.

Turkey is an importer of some varieties of wheat, in particular durum wheat used for producing pasta. Last year, Turkey turned to Australia, one of the world's leading wheat growers, after a lapse of almost 10 years, buying more than 50,000 tonnes of grain for domestic use.

The wider agriculture sector represents the second-largest source of employment in the Turkish economy, providing jobs for around 25% of the workforce, behind only the services sector, with just under 50%.

Drought drying up harvest hopes

Poor rainfall this year may see exports down, imports up and employment levels put under pressure. The majority of Turkey's wheat crop is planted in early to mid-winter, germinating before the coldest part of the season, then lying dormant until early spring before resuming its growing cycle, with harvests in June or early July. Given the timing of the planting, it is more dependent than most other crops on winter rains and snowfall to provide water for initial growth and then on further rains in spring to sustain growth.

According to data released by the State Waterworks Authority, in the last three months of 2013, rainfall across the country was 31.4% down on average, and almost 42% below the figure for the preceding year. If the spring rains follow a similar pattern to that of winter, Turkey will face problems of water shortages both in its cities and in the agriculture sector. As of mid-January, the average water storage rate in the country's dams was just over 35%, well down on the 64% for the same month in 2013.

The shortage of water in some parts of the country is becoming acute. Yavuz Tezcan, the head of the Ceyhan Chamber of Agriculture in the southern province of Adana, recently warned that up to half the expected harvest of 2m tonnes in the Çukurova region, which accounts for some 10% of Turkey's wheat production, could be lost if there are no significant rainfalls in February. Tezcan added that the province of Konya, traditionally the centre of the country's wheat belt, has also been affected by drought.

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Potentially high costs for the economy

Even if spring does bring significant rainfall, it may be too late for some drought-affected regions where the seed grain has failed to sprout due to dry conditions in early winter. Turkey can increase its grain imports to cover any shortfall, but putting bread on the table will come at a price.

Over the past year the value of the lira has dropped by around 25% against the dollar, the main currency for international grain sales, while the expected poor harvest will mean Turkey will not be able to rely on exports to offset these costs.

This would not only exacerbate Turkey's trade imbalance – it could also contribute to inflation. The higher tariffs for grain may be passed on to consumers by the government, which sets tariffs for bread and buying rates for wheat from producers, in turn pushing up prices.

"Turkey's agriculture sector hit by dry weather", 04/02/2014, online at:
http://www.oxfordbusinessgroup.com/economic_updates/turkey%E2%80%99s-agriculture-sector-hit-dry-weather

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❖ Bottom water sources of Lake Sapanca drain away

Lake Sapanca, one of the biggest water reservoirs of Turkey's Marmara region faces with one of the serious water withdrawal, which was triggered by one of the serious drought and excessive consuming.

Water level of Sapanca has drastically been decreasing since the one- year finally reached the alarming point as the bottom water resources which nourishes the Sapanca nearly dried out. According to the last image which was taken by divers showing that the lake has not been nourishing by the deep water springs.

A group of diver experts, who dived into the lake to monitor the effects of drought, found out that the situation is not better at the bottom than outside. Experts announced that bottom feeding sources of the lake dried out which might be considered as the worst scenario for the environmental disaster in Sapanca.

"Bottom water sources of Lake Sapanca drain away", 03/02/2014, online at: http://en.cihan.com.tr/news/Bottom-water-sources-of-Lake-Sapanca-drain-away_0703-CHMTM1MDcwMy8yMDA3

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❖ Ebtekar opposed to transfer of water from Aras River to Lake Urmia

TEHRAN – Masoumeh Ebtekar, the director of Iran's Department of the Environment, has said the DOE will not approve of the proposal to transfer water from the Aras River to Lake Urmia without expert environmental studies.

The lake has been drying up mainly due to overuse of the waters flowing into the river. Declining rainfall is also partly to the blame.

"This department will not endorse the transfer of Aras water to Lake Urmia without expert environmental analyses," Ebtekar told a working group tasked with saving Lake Urmia in Tabriz on Thursday.

Lake Urmia is a salt lake in northwestern Iran, located near the border with Turkey, between the provinces of East Azerbaijan and West Azerbaijan. It is the sixth largest saltwater lake on Earth.

Ebtekar said the lake should be restored in accordance with the "natural potential" of the region.

Transferring water from other sources to the lake will cause great economic damage, she added.

She also said the role of people in the revitalization of the lake is very important, noting, "People's involvement is key to reviving the lake."

Ebtekar, who has been named a Champion of the Earth for her environmental work, stated that the project to construct a bridge over the lake is "one of the main" reasons for the current situation.

She also said development is only possible when environmental factors are taken into consideration.

Now that it is winter time, when farmers are using less water and evaporation is low, the most practical and fastest solution would be to let water from dams flow into the lake.

She added that scientific indexes show that the situation is worrying in all other issues related to the environment.

The situation of Lake Urmia is a wakeup call, she said, adding, "The fate of this lake is a clear example for the country's other lakes."

The director of the Department of the Environment also lamented the extravagant use of energy in Iran.

Commenting on air pollution in Iran's big cities, she said the use of substandard fuel, which is produced at some plants, is one of the main reasons for the country's serious air pollution problem.

"Fuel (consumption) is one of the major causes of air pollution, and whatever the cost, only standard fuel should be produced in the country."

The substandard gasoline that has been produced at some petrochemical plants over the past four years has cost lives, she stated.

Ebtekar also said she had "officially" asked the oil minister to ban the sale of gasoline produced at these plants.

"Ebtekar opposed to transfer of water from Aras River to Lake Urmia", 08/02/2014, online at: http://tehrantimes.com/society/113952-ebtekar-opposed-to-transfer-of-water-from-aras-river-to-lake-urmia-

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❖ Iranian official claims drying of Urmia lake not dangerous for its species

The characteristic species of Lake Urmia, Artemia urmiana (brine shrimps) are not in danger, Iranian Environment Protection Organization's head of Eastern Azerbaijan Environmental Protection department, Hamid Qasemi said, Iran's Fars news agency reported on Feb. 7.

"While the Urmia lake is drying up, the species are not in danger, since they can be kept for up to 50 years," Qasemi said, without mentioning any details.

It should be noted that in 2013 Iran established a special gene bank for saving Urmia lake's Artemia.

It is while, On August 13, 2013, head of Iran`s Artemia research center, Ali Mohsen Pour said that due to drastic increase in lake salinity, there is no Artemia left at all in the lake.

Artemia, which is the sole living creature in lake Urmia, is a genus of aquatic crustaceans known as brine shrimp.

The ability of the Artemia to produce dormant eggs, known as cysts, has led to extensive use of Artemia in aquaculture. The cysts may be stored for long periods and hatched on demand to provide a convenient form of live feed for larval fish and crustaceans.

Lake Urmia in north-west Iran is experiencing its worst drought in many years, where over 70 percent of its water has dried up. The level has been declining since 1995.

Officials have said if the current restoration efforts are not effective, the lake will be turned into a swamp within three years. Previous reports said Lake Urmia needs 3.1 billion cubic meters of water per year to survive.

Lake Urmia is the third largest salt water lake on earth with a surface area of approximately 5200 square kilometers.

Commenting on the revival of the lake Urmia Qasemi said that the most important issue for reviving is managing water resources in the agriculture sector in lake's catchments.

Iran has allocated 220 billion rials (about $8.9 million) to the revival of the lake in the next Iranian calendar year which starts on March 21, the Mehr News Agency quoted the head of Iran's Environmental Protection Organisation, Masoumeh Ebtekar as saying on February 6.

She added that a final approach to save the lake will be declared by the end of the spring. The organization will then start its action plan.

"Iranian official claims drying of Urmia lake not dangerous for its species", 07/02/2014, online at: http://en.trend.az/regions/iran/2239431.html

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❖ Israel-Palestinian peace requires realism on Jordan Valley

The upcoming Israeli-Palestinian agreement outline being prepared by US Secretary of State John Kerry has put the Jordan Valley in the spotlight. That forsaken region, which is part of the Oslo Accord's Area C, is one of the central diplomatic-security issues to be resolved between the sides.

Unfortunately, nature refuses to accommodate the political timetable. The importance of the Jordan River to the three monotheistic religions, to which half of the world's population adheres, has not prevented the human abuse of the river in the last few decades. The Christian belief that John baptized the first believers in the Jordan River, the Muslim tradition according to which the companions of the Prophet Muhammad were buried there and the Jewish story about the people of Israel who crossed the river on their way to the Land of Canaan — none of these protected the river from drying up.

The water sourcing of Syria, Israel and Jordan have reduced the amount of water flowing into the river by 98% compared to the river's flow in the 1940s. This severe water depletion has caused growing environmental, cultural and economic hardship. Perhaps it is this precise combination that will lead to the salvation of the river.

At an emergency conference held in Jordan in November 2013, the heads of churches in the Middle East, of Israel's rabbinate and of the Muslim Waqf signed an interfaith covenant calling for the river's rehabilitation. "We have a different vision of this valley," the signatories wrote. "A vision in which a clean, living river flows from the Sea of Galilee to the Dead Sea, in which the valley's plants and animals are afforded the water they need to flourish, in which the springs flow as they have for millennia and in which the water extracted for human use is divided equitably between the nations that share the valley and the people who live here."

"Friends of the Earth Middle East," whose petition regarding the lands of the village of Battir, has been examining and promoting plans for rehabilitating the southern Jordan River. A team of the NGO's experts in Israel, Jordan and the Palestinian Authority that examined the plans determined that absent regional cooperation, or at least regional coordination, the rehabilitation project will not be economically viable for the three sides.

A financial report compiled by Nir Becker and his team and Saeb Bamya from the Palestinian Authority, among others, said the rehabilitation of the region was expected to increase the three states' revenues from pilgrimage tourism by hundreds of millions of dollars annually. The researchers recommended the development of the Island of Peace along the Israeli-Jordanian border for ecological tourism, which would include water channels and wetlands at the confluence of the Yarmouk and Jordan rivers. Gideon Bromberg, the Israeli director-general of Friends of the Earth Middle East, believes that all that's required for the restoration of the river is a bit of vision and continuous, effective cooperation among the three governments.

The dramatic decline in the amount of water flowing from the Jordan has had a negative impact on the Dead Sea. Since the second half of the 20th century, the Dead Sea's water level has dropped nearly 40 meters (130 feet). This has caused the southern basin to dry up, the beaches to recede, sinkholes to form, along with other damage to the local infrastructure and environment. Here, too, it seems the solution lies in cooperation among the three river neighbors.

On Dec. 9, 2013, Israeli Energy and Water Minister Silvan Shalom, a top Likud member, took part in a festive signing ceremony at the World Bank headquarters in Washington of a regional agreement to build a four-pipe conduit for water from the Red Sea to the Dead Sea. Standing beside Jordan's Water and Irrigation Minister Hazem Nasser and Palestinian Water Authority head Shaddad Attili, Shalom said the pipeline, known as the "Red-Dead project," "fulfills the vision of [Zionist Organization founder Theodore] Herzl for the construction of a water canal."

Shalom explained that this plan represents another "layer of peace with the Palestinians that will lead to strategic, economic and diplomatic cooperation." At the end of the ceremony, Shalom told the media, "The economic damage of not doing anything is greater than the cost of the project. Let us hope that this agreement will be an opening of hope for comprehensive peace in the region."

But there's a catch. It's one thing to talk about cooperation with the Palestinians on projects along the Jordan that ensure economic and environmental dividends for Israel, but quite another to transfer lands across the Jordan, which is essential for the establishment of a sustainable Palestinian state.

In May 2012, at another festive ceremony put on by the Jordan Valley Regional Council, where he received an award for his support of the Jordan Valley, Shalom declared that the valley "is an Israeli success story" and promised that "It is an inseparable part of the State of Israel and has been and will

be eternally under our sovereignty." Shalom, like most of his colleagues in the Likud leadership, talks peace but follows a policy of not doing anything to promote a peace arrangement.

How does a two-state solution reconcile with the status quo in which 85% of the Jordan Valley and the northern Dead Sea — which constitute more than one-quarter of the West Bank area — are off-limits to Palestinians, and 83.4% of the valley lands are under the jurisdiction of the local Jewish councils? Is it really possible to instill in the hearts of the region's Palestinian residents hope for a just peace while the Israeli regime prevents many Palestinian villages from hooking up to the water infrastructure and forces them to make do with a daily consumption of a mere 20 liters (5 gallons) per person, a tiny portion of the daily consumption of their neighbors in the adjacent settlement? With 28 of the 42 Israeli water wells in the West Bank located in the Jordan Valley, is there any sane Israeli who believes that Palestinian President Mahmoud Abbas will deed the area over to Israel?

Just to be on the safe side, in early January some 300 activists in the Palestinian Popular Committees settled into abandoned houses located on the grounds of the Orthodox church at the Ein Hijleh site north of the Dead Sea. The activists declared their campaign, called "Salt of the Earth," against the "targeted killing" of any diplomatic agreement that would include giving up full Palestinian sovereignty over the Jordan Valley.

Israelis who hold dear the fate of the Jordan iver and the Dead Sea, and those among them who are truly interested in an end to the conflict, should get used to the idea of a Palestinian Jordan Valley and northern Dead Sea.

"Israel-Palestinian peace requires realism on Jordan Valley", 05/01/2014, online at: http://www.al-monitor.com/pulse/originals/2014/02/jordan-valley-dead-sea-natural-resource-middle-east-peace.html

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❖ How "historic" Israel-Jordan water deal leaves Palestinians high and dry

World media recently lauded a new project, backed by the World Bank, that will allegedly "save" the Dead Sea and prove that peace is possible through cooperation to manage natural resources. But the scheme only threatens to make an already disastrous situation worse, as well as robbing Palestinians of their right to water.

The Dead Sea, the fabled salt lake bordered by Jordan, present-day Israel and the occupied West Bank, is shrinking at an alarming rate of around 1.5 meters per year. As a result, hotels built right at the shoreline just a few years ago are now dozens of meters from the water's edge.

Environmental assessment studies show that some of the damage done — for instance to the Eastern Aquifer Basin — is already irreversible. To slow and reverse this catastrophe, Israel and Jordan proposed in 2002 to build a 180-kilometer canal to replenish the Dead Sea with water from the Red Sea. They claimed — falsely — that the project would prevent the destruction of the Dead Sea, but the plan never addressed the most obvious and direct cause: the diversion of the upstream waters of the Jordan River, which feed the salty lake, mainly by Israel.

As a consequence the natural flow of the Jordan River — the body of water in which Christian tradition holds that Jesus was baptized — has dropped from 1,350 million cubic meters (mcm) per year of fresh water to the Dead Sea, to a mere 20 mcm.

That is just two percent of its original flow. And even this sad remainder is mostly made up of raw sewage and brine — salty water — injected by Israel south of Lake Tiberias. Additionally, Israel's Dead Sea industries — and on a smaller scale Jordan's — extract potash (used for fertilizer) and other minerals from the southern end of the lake. This large-scale mining operation is greatly accelerating the disappearance of the Dead Sea. Palestinians, meanwhile — although they share the Dead Sea's shore — have never been allowed to share in the region's mineral wealth, nor to draw fresh water from the Jordan.

Devastating environmental consequences

On 12 December 2013, Israel, Jordan and the Palestinian Authority signed a memorandum of understanding in Washington. This deal should not be confused with the plans long floated by the World Bank for a Red Sea-Dead Sea mega-project.

The new deal outlines much smaller initiatives to develop a desalination plant located in Aqaba, Jordan's port on the Red Sea. This would produce fresh water which would be sold to the adjacent city of Eilat in present-day Israel.

The agreement also includes a general suggestion for the construction of a pipeline to transport the desalination brine, a byproduct of the process, from Aqaba to the ever-diminishing Dead Sea. This component is as of yet only an option. The alternative would be to dump the brine into the Gulf of Aqaba whose fragile coral reefs could suffer devastating damage as a result.

In "exchange" for the Aqaba-Eilat deal, Israel would export more water to Jordan in the Lake Tiberias area, in the north, although the source of this extra water is as of yet unclear and it may require further treatment in Jordan.

The cost for the Aqaba desalination project is conservatively estimated at $400 million, while the World Bank's notorious Red Sea-Dead Sea Canal project was estimated to cost well over $10 billion.

The World Bank's scheme — officially known as the Red Sea-Dead Sea Conveyance Project (RSDSCP) — would, Palestinian groups and water experts warn, do irreversible environmental damage and help Israel further dispossess Palestinians of their water rights. However, Israel, and especially Jordan and the World Bank advertise the Aqaba desalination and water swap deal as a "pilot scheme," or even as a first stage to test the environmental impact of adding the mix of Red Sea water and desalination byproducts to the Dead Sea.

It is clearly an effort to attract funding for their old RSDSCP.

Palestinians excluded

It should be emphasized that Palestinians are excluded from both the Aqaba and the Tiberias deals. Palestinian requests to be included in the northern supply scheme were brushed off by Israel. Hence, this project is purely a bilateral deal between Israel and Jordan. A side deal, however, involves potentially selling additional water to the Palestinians.

This water would come from as yet undisclosed sources out of the "Israeli system" — most probably not fresh water, but prohibitively expensive desalinated water from the Mediterranean Sea. Thus the riparian rights of Palestinians — the right to use the water because their territory borders on the banks of the Jordan and the shores of the Dead Sea — are exchanged for the opportunity to subsidize Israel's mushrooming desalination industry.

Ironically, the Israeli chemical and petroleum conglomerates heavily involved in this industry include the Israeli Dead Sea works responsible for much of the environmental destruction in the region.

Falling short

The planned Aqaba plant would provide only moderate amounts of desalinated water (30-40 mcm per year) to Jordan, which is suffering from acute water shortages. Meanwhile, neighboring Eilat, which already has twice the domestic water consumption rates of the rest of Israel, would get a similar amount.

On the other hand, the Aqaba plant would only channel some 200 mcm per year to the Dead Sea, falling far short of reversing or even stopping the drastic declines in the lake's water levels — while risking further damage to the region's unique ecology.

Today, instead of international pressure to reverse the decades-long diversion and mismanagement of the Jordan River — which caused the unfolding environmental catastrophe — both Jordan and the Palestinian Authority are signing deals to make this untenable situation permanent. Their scheme also ignores the concerns — and rights — of the other riparians, Lebanon and Syria.

Neither the governments making the agreements, nor media lauding their plan, have seriously examined its consequences or the alternatives.

Nor do they question the conventional wisdom that more water is needed in a desperately parched region with a rapidly growing population.

Israel's water surplus

The modest amount of water Jordan would gain from Israel in the north would be scarcely enough to meet the needs of the growing population, especially when there is an influx such as the hundreds of thousands of refugees from Syria currently in the country. As noted, Palestinians, would likely only get access to Israeli desalinated water at very high cost.

Neither Jordan nor the Palestinians would gain any increase in their share of Jordan River waters under this deal, only cementing a grossly unfair *status quo* in which Israel diverts the lion's share.
Indeed the structure of the deal is very revealing: during the past decade, Israel has developed into a regional water power with a large water surplus. This is due to its large-scale desalination and waste water re-use, in addition to its long-standing total control over all freshwater resources in historic Palestine.

Israel therefore does not "need" water, let alone more water: it now has a reverse interest of exporting and selling water. It will, in effect, be selling to the Palestinians and Jordanians water supplies that ought to be theirs by right.

No wonder Israel's energy and water minister Silvan Shalom hailed the deal as an "historic agreement that realizes a dream of many years and the dream of [Zionism founderTheodore] Herzl."

No gain for Palestinians

There are many contradictions in the different press releases and statements on the December deal. It would appear that all the parties have an interest in keeping the terms of this memorandum a secret.

Israel has good reason to celebrate this scam as an historic breakthrough — for their interests, however, rather than for peace. So do the Americans who have little else to show for their "peace process" efforts.

Cash-strapped, water-poor Jordan is desperate for any additional water and banks on the hope that the "peace and cooperation" packaging will attract international donors to pay the enormous infrastructure costs.

The Palestinians, however, have nothing to gain, which makes it even more baffling why the Palestinian Authority presents it in a positive light.

Why would Palestinians need to lend legitimacy to the false promise that this was a regional water deal, when it is simply deepening their dependency on the occupier under unfavorable terms and risks that continue to strip them of their historic water rights? Of course, under the occupation, Palestinian leaders have little or no access to badly needed additional water sources.

But why is this deal not disclosed and discussed in public? Why does the PA so mistrust the people it is supposed to represent? Instead, once again the PA is placing Palestinian fate into the hands of Israel, the United States and the World Bank?

Palestinian authorities ignore Palestinians

In October 2013, Palestinian organizations from the water sector voiced their fervent opposition to the World Bank's Red Sea-Dead Sea canal mega-project. They urged the PA and the Palestine Liberation Organization to condemn and halt all forms of cooperation with the World Bank scheme and its partners.

In return, the Palestinian Authority, represented by the Palestinian Water Authority, ignored and completely excluded them from consultations and decisions and surprised them with the new Aqaba-Tiberias agreement.

Finally, why did the PA feel compelled to sign a deal where none of its demands, let alone strategic "historic" interests were even remotely addressed or met? Could it be that, once again, as so often before, the PA was coerced into signing?

With Israel and Jordan's king strongly backing the deal, PA leader Mahmoud Abbas would have felt himself under intense pressure not to spoil the desalination exchange.

The Israel-Jordan-Palestinian Authority water deal exemplifies the features common to all the other agreements signed during the "peace process": it sacrifices Palestinian rights on the altar of Israeli and foreign interests, accommodates the unjust *status quo* and repackages further dispossession and discrimination as steps toward "peace."

Clemens Messerschmid is a German hydrogeologist whohas been working since 1997 in Palestinian and international water projects throughout the West Bank and Gaza Strip. Currently he is affiliated with Rosa Luxemburg Foundation in Ramallah while working towards a doctorate in hydrogeology. Muna Dajani is a Palestinian environmental researcher and activist based in Jerusalem and works on environmental and water rights, activism and social impacts of climate change.

"How "historic" Israel-Jordan water deal leaves Palestinians high and dry", 04/02/2014, online at: http://electronicintifada.net/content/how-historic-israel-jordan-water-deal-leaves-palestinians-high-and-dry/13139

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❖ January: Record-Low Water Levels

Meteorological services determine extremely arid month, Kinneret and other water bodies at lowest measures since recording started.

Figures detailing Israel's water levels show that January was an extremely arid month, with water readings in certain areas at the lowest ever since the meteorological services began keeping records 88 years ago.

The Kinneret Lake's level was at 25% less than average for themonth of January. Meanwhile the western Galilee was 20% below average, the coastal basin 10% below, and the Yarkon-Taninim basin received nearly no precipitation at all.

In the national scale, the amount of precipitation from last September through January was only 64% the annual average for the same period.

Israel has been **suffering from drought** for several years.

While a strong winter storm brought with it **large quantities of rain** last December, even leading to concerns that the **Kinneret might have too much water**, the temporary downpour evidently was not enough to turn back the general dry trend. Indeed, a **similar temporary increase** in water-levels occurred in December 2011 as well.

This January the Kinneret rose merely 11 centimeters (4.3 inches), bringing the total to 211 meters (693 feet) by the end of the month. The Lake was found to contain 18 cubic meters (18,000 liters) in January, making it the second lowest amount for that month since records began. The lowest record was in 2009.

The **Dead Sea** dropped 8 centimeters (3 inches) in January, whereas last year in the same month it rose 3 centimeters (1.2 inches).

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Last December a **water-sharing initiative was signed** between Israel, the Palestinian Authority (PA) and Jordan. The project proposes a new desalination plant at Aqaba to link the Red and Dead Seas and the Kinneret.

"January: Record-Low Water Levels", 03/02/2014, online at:
http://www.israelnationalnews.com/News/News.aspx/177030#.UvaO1WKaD8s

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❖ Region's first water research centre launched

Wadi Wurayah to host volunteers and students in freshwater conservation efforts

Dubai: Wadi Wurayah National Park (WWNP) has become home to the region's first water research centre, where volunteers and students can take part in environmental and conservation activities.

Run by Emirates Wildlife Society (EWS-WWF), in association with Fujairah Municipality and HSBC Bank, the centre was launched on Sunday by Shaikh Mohammad Bin Hamad Bin Mohammad Al Sharqi, Crown Prince of Fujairah.

Earthwatch, a UK-based environmental charity, is partnering with EWS-WWF in shortlisting and selecting the participants.

WWNP is recognised as a Wetland of International Importance by the Ramsar Convention because it encompasses one of the few permanent freshwater sources in the UAE, and conservation partners gathered here on World Wetlands Day on Sunday to officially recognise the Water Research and Learning Programme.

As part of the agreement with HSBC Bank, which is funding the project for five years, only HSBC employees from around the world will participate in the programme initially.

However, in the next stage, the programme will be open for UAE students and researchers as well as other volunteers.

"We have signed a contract with HSBC, and the first batch of volunteers from the bank have already started the programme. We will be watching the progress very closely and will be developing the course further and later we will welcome local students and researchers to participate," said Ida Tillisch, Director of EWS-WWF, speaking to *Gulf News* following the launch of the centre.

The launch coincided with World Wetlands Day "as there is no better time or place to learn about water conservation than in Fujairah where the arid landscape serves to remind visitors of the scarcity of water and the archaeological sites within the wadi attest to those communities whose survival depended upon this water", she said.

"Through this programme we are not only working to conserve this wetland of international importance but also create awareness about the importance of water to life. We believe that the participants following the programme will work as the ambassadors of environment," added Tillisch.

The programme will run every week, apart from the four months of peak summer, as teams of volunteers from across the MENA region will converge on WWNP to participate in an intensive five-day hands-on programme.

"The participants at the Water Research and Learning Programme will be carrying out a long-term freshwater monitoring programme by collecting freshwater ecology data on a continuous basis. The programme is crucial to implementing the Wadi Wurayah National Park conservation strategy. The work done by EWS-WWF and the Water Research and Learning Programme participants is significantly contributing to this goal," said Eng Mohammad Saif Al Afkham, Director-General of the Fujairah Municipality.

Each batch of participants will spend five days and four nights inside WWNP participating in this intensive and rewarding programme.

The Water Research and Learning Programme is designed to involve the participants in hands-on freshwater research activities, and a series of complementary learning sessions in the classroom, providing them with the opportunity to learn more about global and local freshwater issues and to form a personal plan to take action to protect and preserve freshwater in their own lives.

The participants enter the Park at daybreak to collect data on water quality, observe hydrology, and monitor wildlife. After lunch, participants report to the Water Research Centre classrooms and laboratories to analyse data, discuss results and their discoveries in relation to water issues across the Middle East.

After a good meal and a night's sleep, participants return to the field and laboratories for another day's work.

Over the next five years, more than 1,000 volunteers are expected to complete the programme and return to their respective communities and workplaces with newfound knowledge of water challenges in the Middle East and North Africa.

"The programme is expected to motivate them into action against wastage of water and create awareness about water scarcity in the world," added Eng Al Afkham.

"Region's first water research centre launched", 03/02/2014, online at:
http://gulfnews.com/news/gulf/uae/environment/region-s-first-water-research-centre-launched-1.1285842

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❖ January driest month in ages for many regions in Israel

Dry winter is caused by a phenomenon called "blocking," in which most rain systems are "stuck" in Western Europe, expert says.

Although the northeastern US may have spent January pummeled by snowstorms and frigid temperatures, Israel last month was troublingly dry, experts from the Water Authority and Israel Meteorological Services said on Monday.

Throughout the month, Lake Kinneret's water level only rose 11 cm., while that of the Dead Sea dropped eight cm., according to the Water Authority's Hydrological Services.

Nationwide the country has received only about 64 percent of its average annual precipitation since the beginning of the rainy season, the Water Authority said.

In many areas – particularly in the Jerusalem region, the West Bank, the country's center and its northern tip – January was the driest to date, the Israel Meteorological Services (IMS) said.

"The month of January ended aridly in an extreme manner," a statement from the Water Authority said. "In some places it was the driest ever since Meteorological Services began taking measurements."

Only about 25% of the average amount of rain for January fell over the Kinneret basin, with even smaller percentages falling in Western Galilee and the Yarkon and Taninim basins.

By February 1, Lake Kinneret reached only 211.28 m. below sea level, reflecting the "abnormal cessation in rains" that persisted from the middle of December through nearly all of January, the Water Authority said.

The available volume of water in Lake Kinneret in January amounted to about 18 million cu.m., significantly lower than the average volume for January, as well as for last January.

In the 88 years since Hydrological Services has been measuring the Kinneret's available water volume, it was only this low in January of 2009, the authority said.

Following a decline of three cm. in December, the Dead Sea dropped an additional eight cm. in January, the data said. Since the beginning of the 2013-2014 hydrological year, the Dead Sea has dropped 33 cm., compared to 26 cm. in the same season last year.

The amounts of rain that fell in January represent "a negative record in the Center and parts of the North of the country," the IMS said.

While for most stations the IMS has data accumulated over the past 70 years, there are some areas with more than 90 years of records.

This was the driest January for Jerusalem, for which the IMS has data ranging back to the mid-19th century.

Particularly uncharacteristic of the month was the complete lack of rainfall in the Jordan Valley and the Beit She'an Valley, the IMS said.

Such a condition, in which a northern or central monitoring station did not record any rain in January, previously occurred only in 1955, the organization added.

Although less than average amounts of precipitation fell over the coastal plain, the reservoirs along the plain did rise over the month of January – 12 cm. in the South, five cm. in the Center and eight cm. in the North – for the third year in a row, the Water Authority reported.

All in all, the northern coastal plain received between 15 and 40 mm. in January, compared to the annual average of approximately 130-160 mm. for this month, according to Israel Meteorological Services.

The central coastal plain and most of the south received between five and 15 mm., compared to the usual 120-150 mm.

The largest amounts of rainfall fell in the central Galilee, with about 35-55 mm. of precipitation wetting the region.

These quantities, however, represent less than 30% of the region's January average, IMS data said.

Other parts of the Galilee and the Golan only received between 20 and 30 mm., in comparison to the usual 150-200 mm.

The minimal amount of rainfall over the Western Galilee and increased resource exploitation there contributed to sharp declines in the water level of the basins in the region, the Water Authority said.

The springs of the Western Galilee also featured sharp drops in their flow rates for the month of January.

The flow rates of the Dan and Banias springs also declined, due to the decreased amount of rain falling over Lake Kinneret, the Water Authority said.

In addition to the abnormally dry conditions that characterized January, temperatures were also higher than usual, reaching more than four degrees Celsius above the period's average for the second half of January, according to the IMS.

Although this January may have been the driest for many areas of the country, it is too short of a period to speak of climate change trends, Amos Porat, director of the IMS Climate Department, told The Jerusalem Post on Monday.

This dry winter, he said, has been caused by a phenomenon called "blocking," in which most of the rainfall systems were "stuck" in Western Europe, Porat said.

While Israel received fair and dry weather, countries like the United Kingdom and France experienced a lot of rainfall and stormy weather.

This has been the prevailing situation since the beginning of winter, aside from the two-week stormy period in mid-December, Porat added.

"After a dry January, February doesn't look good either," he said.

"We don't see a significant weather system in the coming week. However, these systems might come later."

"January driest month in ages for many regions in Israel", 07/02/2014, Jerusalem Post, online at: http://mideastenvironment.apps01.yorku.ca/2014/02/january-driest-month-in-ages-for-many-regions-in-israel-jerusalem-post/

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❖ Project to promote better water consumption habits in Zarqa

'MCA-Jordan completes 45% of wastewater network rehabilitation project' by Hana Namrouqa

Once the expansion of the Samra Wastewater Treatment Plant is completed, the plant will become one of the largest wastewater treatment plants in the Middle East and North Africa, according to the Millennium Challenge Account – Jordan

AMMAN — The Millennium Challenge Account — Jordan (MCA-Jordan) on Monday launched a new project to improve household water systems and decrease domestic water costs in Zarqa Governorate.

The Water Smart Homes project's first phase includes an outreach campaign to raise awareness and encourage the public to manage water consumption efficiently, while the second phase will improve water and wastewater systems at the homes of National Aid Fund beneficiaries in Zarqa, some 22km east of Amman.

"The outreach campaign of the Water Smart Homes will tackle the public's incorrect perceptions of water and wastewater services in Zarqa to eventually reinstate their trust in the quality of water and wastewater systems," MCA-Jordan CEO Kamal Zoubi said at a press conference.

The project's funding is covered under the $275-million grant from the Millennium Challenge Corporation (MCC).

The grant also covers the rehabilitation and expansion of the wastewater network, the rehabilitation and restructuring of water networks and the expansion of the Samra Wastewater Treatment Plant.

Briefing the media on the progress of the three ventures, Zoubi said 45 per cent of the rehabilitation and expansion of the wastewater network project has been completed, noting that around 85 kilometres out of the designed 187 kilometres of sewage pipes, was finished by the end of January 2014.

"MCA-Jordan will hand over part of the project to the Ministry of Water and Irrigation in March," Zoubi said, underscoring that the construction work is in line with the MCC's rigorous environment, social, and gender regulations and policies.

Meanwhile, five out of six tenders have been awarded to implement the rehabilitation and restructuring of water networks project, he said, adding that contractors have already started with the project's infrastructure work.

Water loss in Zarqa is expected to drop from the current 50 per cent to less than 35 per cent, while water supply will increase from 36 to 70 hours per week once the project is completed, according to MCA-Jordan.

Zoubi said total progress at the Samra Wastewater Treatment Plant has reached 60 per cent, while 50 per cent of the project's infrastructure has been completed.

Once the expansion is completed, the plant will become one of the largest wastewater treatment plants in the Middle East and North Africa, as it is projected to treat over 70 per cent of wastewater generated in the country, according to MCA-Jordan.

The plant currently treats 60 million cubic metres (mcm) of wastewater, and the capacity will more than double to 133mcm after the expansion, according to the state-owned company.

MCC Resident Country Director Alex Russin said the MCA-Jordan programme is based on a partnership between the US and the government, noting that the project seeks to expand Zarqa residents' access to clean water and sanitation.

"We are very pleased with the commitment and progress, and it looks like all construction will be completed on time," Russin said, noting that the US government's assistance to the Kingdom's water sector will continue.

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

"Project to promote better water consumption habits in Zarqa" ,Jordan Times, 07/02/2014, online at: http://mideastenvironment.apps01.yorku.ca/2014/02/project-to-promote-better-water-consumption-habits-in-zarqa-jordan-times/

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❖ Israel is creating a water surplus using desalination

SEDE BOQER, Israel -- In the land of milk and honey, water has always been in short supply.

Researchers here have linked temperature rise and drought to migration patterns across this arid region dating back to biblical times. Now, for the first time in its history, Israel is on track to experience a water surplus.

The tricky part is scaling up the chemistry and reducing the cost of separating salt from seawater.

The first major desalination plant in Israel opened in the southern city of Ashkelon in 2005. Since then, four more large-scale seawater desalination plants have come online, with additional capacity in the pipeline.

In the span of a decade, desalination has come to produce about 40 percent of Israel's water supply. On its current trajectory, Israel will have access to more than 600 million cubic meters of desalinated water per year by 2015, which amounts to more than half the country's total freshwater needs.

Desalination has led to a resource revolution in Israel, said Shlomo Wald, chief scientist at the Ministry of Energy and Water Resources. "Now, Israel isn't always dependent on the mercy of God to give us rain," he said.

Drought's stress eases

For the last seven years, Israel has been in a severe drought. The country's largest freshwater resource, the Sea of Galilee, had been hovering around critical lows until the rains returned last year.

By increasing Israel's desalination capacity, water managers won't have to draw on natural resources for everyday usage, allowing the region's aquifers to finally recover, said Eilon Adar, director of the Zuckerberg Institute for Water Research at Ben-Gurion University.

In the 1960s, the thirst for water led Israelis to develop highly efficient drip irrigation systems. Today, Israel also treats and recycles more than 80 percent of household wastewater. Spain, which has the second-highest reclamation rate, recycles about 30 percent.

These long-standing practices, combined with desalination, have helped Israel "conquer the desert," Adar said, "rather than be pushed away by the desert."

Israel now has enough available water that the government has decided to curb production at four of the largest desalination plants. This year, the national water company Mekorot will buy 360 million cubic meters of desalinized seawater, just 70 percent of a total 510 million cubic meters of production capacity.

Desalinated water is expensive to make, and desalination plants are extremely capital-intensive to build. So why build them if they're not going to be fully used?

Climate change insurance policy

"It basically becomes an insurance policy against future extreme drought," said Reese Tisdale, president of Bluefield Research, a U.S.-based water sector research group. It's not a question of when drought will strike again, he said, but how soon.

Climate models predict Israel will see a continued decrease in available water resources through 2035. The Organisation for Economic Co-operation and Development anticipates that Israel will see a decrease in precipitation and that water supplies will drop at least 25 percent as early as 2070.

"One thing about plants in Israel -- and I think this is in defense of plants being installed -- is that they may have plenty of water now, but the expectation is either drought is going to return or there will at least be some volatility," Tisdale said.

Water shortages aren't unique to the Middle East. As populations grow and temperatures rise, demand for fresh water will spike across the globe. For many communities, survival may depend on the ability to economically produce fresh water from the sea.

Israeli expertise could play a vital role in expanding water access. Despite its small size, Israel ranks next to the United States and Singapore as a desalination market leader, according to Tisdale.

"Israel is the heart of know-how in desalination worldwide," Wald said of the water and energy ministry. "We don't manufacture the membranes, we don't manufacture the pumps. But the engineering and the way a desalination plant should be designed and built, I think, the international hub is here in Israel."

Selling to China and the U.S.

Energy is the No. 1 driver of cost in desalination. Due in part to Israel's own resource constraints, Israeli companies have come to offer some of the cheapest desalinated water in the world -- about 60 cents per cubic meter.

The establishment of reverse osmosis desalination, which is less energy-intensive than the traditional method of using heat, has helped cut desalination costs across the board. Reverse osmosis works using semipermeable membranes to remove salt from water. Today's membranes are 20 times more efficient and one-fifth the cost of the first membranes tested in the 1950s.

IDE Technologies, one of Israel's most prominent desalination companies, has developed ways to further cut costs by using fewer pumps and energy recovery devices. At Israel's Ashkelon desalination plant, for instance, IDE spearheaded a method of generating power by using high-

pressure brine to help rotate the pump motor. A standard turbine can recover about 80 percent of input energy; this process boosts energy recovery to 96 percent.

IDE has built three of Israel's five largest desalination plants, including the Sorek project that meets 20 percent of Israel's municipal water needs. IDE has also built China's largest desalination plant and is building the largest desalination plant in the United States: a $1 billion facility in Carlsbad, Calif.

Energy recovery technology used at the Carlsbad plant, set to come online in 2016, will save $12 million in annual energy costs. Energy savings will also cut greenhouse gas emissions to the tune of taking 8,500 passenger vehicles off the road for one year. Through additional mitigation steps, the plant is expected to reach carbon neutrality.

"Each project that you do ... you think is the end of ends and no one could get more efficient than that," said Avshalom Felber, CEO of IDE Technologies. "And then you yourself come up with another innovation."

“Israel is creating a water surplus using desalination”, 07/02/2014, online at: http://www.eenews.net/stories/1059994202

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❖ Whose Garbage Is This Anyway?

HEBRON, West Bank — It was not your usual Holy Land tour, but surely one of the most revealing I've ever had. A team from Friends of the Earth Middle East took me around to see how waste, sewage and untreated water flow, or don't, between Israel and the West Bank. I never realized how political garbage and dirty water could be, or how tracking it could reveal just why making peace here is so urgent.

For starters, who knew that when you flush the toilet in your hotel in the eastern half of Jerusalem the wastewater likely ends up in the Dead Sea — untreated? It flows from Jerusalem's sewers into the Kidron Stream. If you can stand the stench, you can watch it all rush by about a mile east and downhill from Jerusalem. Germany offered to pay for a treatment plant, but for the past 20 years Israel and the Palestinian Authority have not been able to agree on how to split the treated water — which originates in both Jewish and Arab drains, so nothing has happened. As a result, Mother Nature alone does her best to filter it as it flows down to the Jordan Valley, where Jewish settlers use some of this poorly treated water to irrigate their date palms. The rest ends up in the Dead Sea. Good thing it's already dead.

We've learned in the last few years that the colonial boundaries of the Middle East do not correspond to the ethnic, sectarian and tribal boundaries — and it is one reason that some Arab states are breaking up. But neither do the ecosystem boundaries correspond with any borders or walls. And the fact that Israelis and Palestinians have not been able to reach a power-sharing agreement that would enable them to treat the entire ecosystem here as a system is catching up with them.

When the region got hit in January 2013 with snow and rain from a freak and massive storm, the runoff was so powerful down the Alexander Stream, which flows from the Shomron Mountains near the West Bank town of Nablus into Israel, that it overflowed. So instead of going under the thick cement wall Israel has erected around the West Bank to keep out Palestinian suicide bombers, the flood blew away a whole chunk of that wall. Mother Nature laughs at our "green lines."

Now consider what is going on in the Hebron Industrial Zone, home to 13 tanning factories, including the Al-Walied for Leather and Tanning Company, where hides are hanging everywhere

from the ceiling and a single worker is putting them through a machine that squeezes out the moisture from the softening process.

The problem, explained Malek Abu al-Failat, from the Bethlehem office of Friends of the Earth Middle East, which brings Israelis, Jordanians and Palestinians together on one team, is that the tanneries use chromium 3 to soften the hides and then let the effluence flow into the drains and down the Hebron Stream. That effluence exceeds 5,000 milligrams of chromium 3 per liter. The global safety standard is 5 milligrams! When the chromium 3 hits the water and oxygen, it becomes chromium 6, a known carcinogen. So, in 1998, the U.S. Agency for International Development built a treatment plant here that effectively extracts all the chromium 3 and recycles it. But, in 2005, Israel identified the sulfuric acid used in the recycling as a dual-use chemical that Palestinians could employ to make a bomb and banned its use by tanners. So the chromium 6 is now back in the water, which flows from Hebron to Beersheba, one of Israel's largest cities, and then on to Gaza and out to sea, into waters used by Israel's desalination plants.

We visited the Al-Minya Sanitary Landfill that was built with grants from the World Bank, European Union and USAID so Palestinians could close down 19 unauthorized and unsanitary dump sites around Bethlehem and Hebron. It was supposed to open in September, but, as I saw, its 65 acres were still pristine because the Israeli military told the Palestinian Authority that if the site didn't also accept garbage from the Gush Etzion Jewish settlements it could not open, said Failat. Palestinians say it's unfair that they lose their land to settlements and then have to accept their garbage.

Meanwhile, Gaza, which has been woefully mismanaged by Hamas, is pumping all its drinking water from its coastal aquifer at triple its renewable rate of recharge. As a result, saltwater is seeping in. Last year, the U.N. said that by 2016 there will be no potable water left in Gaza's main aquifer. Gaza has no big desalination plant and would not have the electricity to run it anyway. I don't want to be here when 1.5 million Gazans really get thirsty.

Israelis, Palestinians and Jordanians actually have all the resources needed to take care of everyone, but only if they collaborate, explained Gidon Bromberg, co-founder of Friends of the Earth Middle East. Israel, which is the world leader in desalination and wastewater recycling, could use its own cheap natural gas and solar power generated in Jordan — where there is lots of sunny desert — "to provide desalinated and recycled water for itself, Gaza, Jordan and the Palestinian Authority."

Everyone would win, which is why Bromberg suggests that Secretary of State John Kerry take Israeli and Palestinian negotiators on an eco-tour to see "the seeping time bomb that's ticking underneath both of them." It, too, will explode if they don't forge a deal that enables them to live apart, but in a framework that also enables them to work together to protect the water, soil and air that they will always have in common and can only be preserved by acting in common.

"Whose Garbage Is This Anyway?", 08/02/2014, online at:
http://www.nytimes.com/2014/02/09/opinion/sunday/friedman-whose-garbage-is-this-anyway.html?_r=0

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❖ Environmental Peacemaking, February 2014 – Ecopeace / Friends of the Earth Middle East

Water Cannot Wait campaign launch

EcoPeace/ Friends of the Earth Middle East, together with the Institute for National Security Studies (INSS) held a conference in Tel Aviv as part of the launch of our "Water Cannot Wait" campaign. The conference, entitled "Cross Border Environmental Issues and Water Resources in the Context of the Peace Process", featured Israeli Justice Minister & Chief Israeli negotiator Ms. Tzipi Livni, renowned NY Times journalist Thomas Friedman, and a panel of water experts, who discussed the need for joint management of cross-border environmental issues, with a particular focus on the urgency of dealing with water as one of the final status issues of the peace process.

The campaign calls on Israeli Prime Minister Netanyahu, Palestinian President Mahmud Abbas and US Secretary of State John Kerry to urgently move forward on environment and water issues in the current negotiations.

Click here to read the 10 reasons – for Israelis – why water and environment solutions can no longer wait. Read more in our media release, and many articles, including from the Guardian, The Jerusalem Post, Haaretz and more on the project's press coverage webpage.

FoEME's Water Cannot Wait Campaign is supported by the Skoll Global Threats Fund, the Rockefeller Brothers Fund and the Swedish International Development Cooperation Agency (SIDA).

Jordan River "Faith-Based" Advocacy Program

FoEME staff gave a presentation on the bridge between faith and environmental activism as part of the Interfaith Center for Sustainable Development (ICSD) Women's Interfaith Ecology Project seminar series. The unique seminar brought together a group of 30 Muslim, Christian and Jewish women in Israel between the ages of 19 and 26 to promote a more sustainable and peaceful future. FoEME's Jordan River Faith Based Advocacy Program was presented as an example of how faith based communities can come together in partnership on environmental issues in the region. To learn more about this seminar please read the ICSD's blog.

FoEME's Jordan River Faith Based Advocacy Program, part of the Jordan River Rehabilitation Project, is supported by the Swedish International Development Cooperation Agency (SIDA) and the Osprey Foundation.

Battir – Israeli High Court Hearing

On January 29th, the High Court of Israel held another Hearing on the petition submitted by FoEME and the Village of Battir regarding our objection to the building of the Separation Barrier in this sensitive landscape.

Although we thought that this was to be the Final Hearing, the issue is complex and the court has now requested further clarifications from the respondents (mainly the Israeli Ministry of Defense) and ordered that both the Israel Railway and the Ministry of Transport join as additional respondents to the petitions. More details in our latest press release following the Hearing.

Read articles by Sky News, The Telegraph, Middle East Online and more, published ahead of the Hearing, on our Good Water Neighbors / press coverage page.

5 Cross Border Youth Camps

January was another month packed full of cross border youth camps. 5 cross border camps were held during 2 weekends, involving 180 youth "Water Trustees", from more than 20 "Good Water Neighbors" communities.

As always, the camps begin with introductory "ice breaking" games, and then later, a hike or visit to the nearby water source, learning about the community's water and environmental story. Fun games, such as scavenger-hunt type missions, tracking down specific sites and at each point discussing a different environmental issue, and circle games requiring cooperation and teamwork, were also part of each camp experience. Read more about the specific youth camp held in Beit Alpha in this blog.

The Good Water Neighbors project is funded by the Swedish International Development Agency (SIDA), the European Union's Partnership for Peace Program, and the German Federal Ministry for Economic Cooperation and Development (BMZ).

Sharhabil bin Hassneh EcoPark goes bird watching!

Further to last month's item about building a "bird hide" in the Sharhabil bin Hassneh EcoPark; we have almost completed the structure, made out of different colored plastic bottles filled with sand. This environmental education activity was carried out by a group of students from the Kings Academy in Jordan over several days, where they learned about the importance of recycling and the contribution of bird watching to a "green" economy.

Looking for something to do this weekend? You are invited to come bird watching at the EcoPark and see the variety of birds that have returned to the area!

FoEME's new "Green Economy Initiatives" project is funded by USAID's Conflict Management and Mitigation Program.

Cloud Seeding

FoEME's Jordanian Director Mr. Munqeth Mehyar met with the Ambassador of Thailand Mr. Piriya Khemponr in Amman Thursday January 30th. The two discussed the water situation in the region and looked into "Cloud Seeding", a program successfully developed and used in Thailand to enhance rainfall. Once implemented, the program is expected to help Jordan in managing its atmospheric and water resources. Click here for more information about Thailand's Royal Rainmaking Program.

"Environmental Peacemaking, February 2014 – Ecopeace / Friends of the Earth Middle East", 07/02/2014, online at: http://mideastenvironment.apps01.yorku.ca/2014/02/environmental-peacemaking-february-2014-ecopeace-friends-of-the-earth-middle-east/

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❖ SIS reviews legal aspects of Nile water issue

The State Information Service (SIS) issued a new edition of its quarterly magazine "African Perspectives" in Arabic, English and French. The new edition comes within the framework of the media role undertaken by the SIS to serve strategic issues of Egypt for reviewing the various aspects of the Nile water issue.

SIS Chairman Ambassador Salah Abdel Sadek, in press statements on Monday 3/2/2014, explained that the new edition includes several topics related to the legal aspects of the Nile water issue, starting with the legal terms of reference for the agreements regulating the Nile River water and settling disputes over uses of international rivers and the principle of equitable benefiting of Nile water, passing through legal regulations governing the establishment of water projects on international rivers and ending with the principle of natural conditions' change and its impact on the agreements of the Nile Basin together with water cooperation among Nile Basin countries.

Ambassador Abdel Sadek added that the new edition comes out of keenness by SIS on highlighting strategic Egyptian issues, atop of which comes the Nile water file that should be placed in its proper media status in a scientific way. This is why SIS has issued its 39th edition of the magazine which is an outcome of cooperation between SIS and several legal research and studies centers affiliated to the State Council in a scientific attempt to give a model example for cooperation and integration among the institutions of the Egyptian State.

Ambassador Abdel Sadek underlined the importance of Africa for Egypt after June 30 Revolution, which re-arranged the priorities of State institutions in accordance with the criteria of foreign policy and national security of Egypt; where SIS is maintaining its media and development role in this respect through its various publications atop of which comes the "African Perspectives" magazine.

"SIS reviews legal aspects of Nile water issue", 03/02/2014, online at:
http://www.sis.gov.eg/En/Templates/Articles/tmpArticleNews.aspx?ArtID=75885#.UvdbRGKaD8s

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❖ Egypt has no plans to take Ethiopia dam file to AU

Egyptian ambassador to Ethiopia Mohamed Idris has denied reports of Egyptian plans to lodge a formal complaint with the African Union (AU) over Ethiopia's massive hydroelectric dam project on the Nile River.

"No official decision has been taken in this regard," Idris told a Wednesday press conference in Addis Ababa.

Within the last year, relations between Egypt and Ethiopia have become strained over the latter's construction of a multibillion-dollar hydroelectric dam on the Nile's upper reaches.

The project has raised fears in Cairo that the project could affect Egypt's historical share of Nile water, which represents the country's primary water source.

Speaking in the Ethiopian capital, Idris called for stepped-up cooperation between Egypt, Ethiopia and Sudan on the dam.

"We've already agreed on some aspects, while we're yet to agree on others," he said.

On Monday, a 45-strong Egyptian diplomatic delegation arrived in Addis Ababa for a five-day visit to Ethiopia.

The following day, delegation members met with AU Peace and Security Commissioner Smail Chergui and AU Infrastructure and Energy Commissioner Elham Ibrahim.

The delegation is scheduled to visit Ethiopia's northwestern city of Bahir Dar– home of Lake Tana, the source of the Blue Nile– on Thursday.

"Egypt has no plans to take Ethiopia dam file to AU", 06/02/2014, online at:
http://www.worldbulletin.net/news/128326/egypt-has-no-plans-to-take-ethiopia-dam-file-to-au

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❖ Egypt and Ethiopia spar over the Nile

On Jan. 8, Ethiopia turned down Egypt's demand that it suspend construction of its mega-dam on the Nile, further escalating tensions between the two states. Fearing that Ethiopia's $4.2 billion project would reduce the river's flow, Egypt calls for a halt in construction until the dam's downstream impact is determined. Otherwise, it has vowed to protect its "historical rights" to the Nile at "any cost."

While scoffing at Egyptian threats, Ethiopia has called for Cairo's collaboration in negotiations and claims that the dam will have no adverse effect on Egypt. It would, in fact, decrease evaporation and improve water flow. Ethiopia hopes that the ambitious hydroelectric project, slated to be completed in 2017, would catapult the country out of poverty. Frustrated by what it described as Ethiopia's stubborn stance, Cairo is threatening to take the issue to the United Nations Security Council.

Is this just standard diplomatic brinkmanship before an inevitable compromise, or a harbinger of a looming water war? Regardless, the lack of progress on the diplomatic front bodes ill for a quick end to a stalemate that has long gripped the region. Home to 600 million people, more than half of Africa's total population, the Nile Basin is already traumatized by endless internal political strife and mounting pressures to feed a population growing at Malthusian proportions.

However, as ominous as it sounds, the collapse of the talks does not necessarily mean Egypt and Ethiopia will soon be locking horns. Despite suggestions to the contrary, this is simply the waning phase of a protracted diplomatic dance before an inevitable conciliation.

A dam for development

Although known as northeast Africa's water tower, Ethiopia until recently had not bothered to utilize its many rivers. The inability to make use of the Nile has been Ethiopia's age-old national lament. That changed in 2011, when the country announced plans for the construction of its so-called Great Ethiopian Renaissance Dam (GERD), designed to generate a staggering 6,000 megawatts of electricity. By situating the project only 19 miles from the Sudanese border on the vast Blue Nile gorge, where the land is unsuitable for agriculture, Ethiopia sought to reassure Egypt but ended up stoking its fears.

The design and impacts of the GERD are shrouded in secrecy. Observers cast doubts on its timely completion. In a flawed bidding process, Ethiopia granted the project to a Milan-based engineering company, Salini Costruttori, circumventing its own contract procedures and international standards on procurement. The construction is reportedly lagging behind schedule and faces several unresolved technical problems, one of which is how long it takes to fill the dam. Ethiopia claims the project is on course and dismisses facing any technical hurdles.

One of Africa's fastest-growing non-oil economies, Ethiopia has embarked on a state-led development fashioned after the economic miracles in South Korea and the rest of the so-called Asian tigers. Ignoring warnings from the International Monetary Fund and the World Bank that such a massive publicly funded infrastructure project would starve private investments, Ethiopia is forging ahead. To wit, when Egypt used its influence with international financiers to choke off funding, Ethiopia declared it would finance the project with domestic resources.

Gift of the Nile

The founding myths of many ancient civilizations center on famous rivers — the Euphrates and the Tigris (Babylon), the Yangtze (China) and the Ganges (India), to name a few. However, not many are as inextricably dependent on a single river for their livelihood as Egypt is on the Nile. Egypt's history is defined as much by the flooding and drying beds of the Nile as by the pyramids. For a country described by Herodotus as "the gift of the Nile," control over the majestic river has been an existential Egyptian preoccupation since antiquity.

The world's longest river is made up of a maze of tributaries. Nineteenth-century explorers went on a wild goose chase to locate the mysterious river's murky origin before tracing it to Lake Tana in Ethiopia and the Great Lakes in Central Africa. Two of the river's main tributaries are the Blue Nile and the White Nile. The Blue Nile, accounting for upwards of 80 percent of the Nile waters, originates in northern Ethiopia. It makes a steep descent from Ethiopian highlands — carrying brown silt — before it joins the White Nile in Khartoum, Sudan's capital, augmented by several large rivers from southwestern Ethiopia. The White Nile originates in Burundi and flows northward from the Great Lakes region, crossing Tanzania, Uganda, and South Sudan.

Who owns the Nile?

The Nile's origin being outside its borders did not prevent Egypt from getting the lion's share of its waters. The claim for exclusive ownership of the Nile waters is premised on a 1929 treaty between Egypt and Britain's East African colonies, Burundi, Kenya, Rwanda, Tanzania and Uganda. These colonies gained independence from Britain in the 1960s. The treaty awarded 57 percent of the waters to Egypt while also requiring other nations to clear with Cairo before launching any major water project on the river. Another treaty, signed in 1959 between Egypt and Sudan, raised Egypt's share to 66 percent. The two signatories, divvying up virtually all of the Nile waters, did not even consult Ethiopia, the main source of the river. After the 1959 accord, both Egypt and Sudan built mega-dams to exploit the water for irrigation.

For years, upstream Nile Basin countries — Burundi, Ethiopia, Kenya, Rwanda, Tanzania and Uganda — nursed misgivings about the colonial-era accord, in which they had no say. However, they grudgingly acquiesced mainly because, unlike Egypt and Sudan, whose arid lands are watered by the lone river, they are not wholly reliant on the Nile. But, finding the challenge of feeding their growing populations on rain-fed subsistence farming unbearable, upstream countries initiated negotiations in 1999 to find an equitable and reasonable way to share the Nile waters. The decade-long negotiations resulted in the 2010 Cooperative Framework Agreement, known as the Entebbe Agreement. The landmark accord, signed by the six upstream countries, was rejected outright by both Egypt and Sudan. Touted as "an African solution for an African problem," the agreement calls for the creation of a commission to oversee development projects on the Nile. It needed ratification by the legislatures of each of the signatory countries. But its implementation is in limbo until another Nile Basin country — for example, the Democratic Republic of the Congo, which is now sitting on the fence — signs it.

Ethiopia's diplomatic coup

In a further blow to Egypt, its alliance with Sudan faltered in 2012 when Sudan, which gets 35 percent of the Nile water according to the 1959 treaty, rescinded its initial opposition to Ethiopia's renaissance dam. Khartoum's change of heart is attributed to a still-secret report by a panel of international experts that concluded the dam would neither significantly affect downstream countries

nor fundamentally alter the flow of the river. But Sudan's internal vulnerabilities presumably played a crucial role.

In 2011, Sudan saw a huge chunk of its land mass secede to form Africa's newest state, South Sudan. Ethiopia's support for the former rebels of South Sudan (currently embroiled in a power struggle of their own) was instrumental in forcing Sudan — Egypt's loyal ally — to accept the divorce. An international warrant for Sudanese President Omar al-Bashir in connection with the conflict in Darfur has made the country an international pariah. Sudan could not afford to alienate its increasingly assertive neighbor to the south and eventually threw its weight behind Ethiopia's colossal undertaking. Although it has yet to sign the Entebbe Agreement, which loosens Egyptian and Sudanese dominion over use of the Nile waters, Sudan's new stance hands Ethiopia a diplomatic coup.

'Egypt's ill designs'

The most recent Egyptian president to threaten war to protect Egypt's "inviolable" rights over the Nile was the Muslim Brotherhood's Mohamed Morsi. Last June, in a secret all-party discussion chaired by then-President Morsi, which was "mistakenly" broadcast live on state TV, Egyptian lawmakers suggested arming Ethiopia's political opponents to obstruct the construction. The tension subsided with the military takeover in Cairo. However, after a brief interlude in which it appeared that diplomacy was to replace the menace of war, the military regime is now raising the ante. The high brass knows full well that a food shortage resulting from a significant reduction in water volumes means riots in Egyptian cities.

The last time Egypt staked its claim militarily over the Nile and the Red Sea was in 1876, when it invaded Ethiopia. The two armies met at Gura, now an Eritrean territory. Egypt's army was nearly wiped out by an ill-equipped and ragtag Ethiopian side that would, two decades later, go on to hand Italy a humiliating defeat at the battle of Adwa. Although it never ruled out direct military confrontation with Ethiopia, Egypt has since reverted to proxy wars.

For centuries, Muslim Egypt supplied the head of Ethiopia's Orthodox Church, a state religion until the 1974 revolution. The imperial regime of Haile Selassie found itself under political pressure to leave the centuries-old arrangement intact following the 1959 Nile accord that excluded Ethiopia.

Despite this historical relationship, Ethiopia's official historiography is replete with Egypt's ill designs over it. In the 1970s, Ethiopia blamed Egypt for fanning the Republic of Somalia's irredentist claims over the Somali-inhabited Ogaden region of Ethiopia. The two countries went to war twice over the Ogaden.

Egypt is also faulted for its role, with Sudan as its accomplice, in precipitating Ethiopia's loss of access to the Red Sea with Eritrea's independence. Eritrea broke away from Ethiopia in 1993 after 30 years of civil war.

Internal fragility

Official rhetoric notwithstanding, both Egypt and Ethiopia are represented by shaky regimes presiding over brittle states and divided societies. Given their internal vulnerabilities, neither country can afford to go to war — a war whose outcome is uncertain.

While Ethiopia saw its economic fortunes rise over the last decade, its internal cohesion has not kept pace. Ethnic and religious cleavages as well as a border dispute with Eritrea (over which the two states fought a bloody war from 1998 to 2000) are constant reminders of its enduring fragility. Ethnic Tigreans, estimated at 6 percent of the population, have been in power since 1991. They dominate the country's politics, military, security and economy. This is resented by both the Oromo, Ethiopia's majority population, and the Amhara, its traditional rulers. Over the last two years, the country's otherwise docile Muslim population, long marginalized despite accounting for a sizable portion of the population, has been increasingly restive. Ethiopia's single-party leadership has not fully recovered from the death in 2012 of its strongman of two decades, Prime Minister Meles Zenawi. The new prime minister, Hailemariam Desalegn, a Protestant and from another minority group, does not hold as much clout as his predecessor and is seen as a temporary figure.

Khartoum's woes did not end with the secession of South Sudan, either. Its army is struggling to contain rebels in the Nuba Mountains. Muffled though they appear, Sudan's troubles in Darfur are far from over. Alienated by former allies, his capital rocked by Arab Spring–inspired unrest over the last two years, Bashir's three-decade hold on power is tenuous. He also has to dodge the arrest warrant from the International Criminal Court in The Hague.

Egypt is facing far more serious calamities. It fired the imagination of the world's youth with its peaceful 2011 revolution. With the military wresting the reins of power back from its nemesis, the Muslim Brotherhood, and clamping down on dissent, the country has clearly slid backward. Pursuant to the overthrow of Morsi, its first democratically elected president, Muslim-Christian relations have soured. The elevation of a trigger-happy general to the presidency would heighten Egyptian vulnerabilities. In short, with Sudan now squarely in Ethiopia's camp, Egypt could not stage a ground attack on the dam. War by proxy has run its course. An airstrike is still possible but fraught with risks.

The tensions over the Nile, however, are not simply an old-fashioned competition for a scarce resource. They are rather symptomatic of deeper underlying schisms. The Nile marks the divide between black sub-Saharan Africa and the Arab Maghreb, and forms the fault line between Christian, Muslim, and indigenous Africa.

Moreover, the rhetoric of water wars over the Nile misses the crucial voice of marginalized indigenous populations — whose lives are altered by these state-sponsored megaprojects. While the construction of the Aswan Dam in Egypt and a smaller one in Sudan have enabled the two countries to develop thriving agro-industries, they caused wanton destruction to the Nubian people's ancient way of life. As a result of the secrecy surrounding the Nile discussions and the lack of tolerance for political dissent in all three countries, there is little discussion of the dam's impact on indigenous communities and the horrendous environmental consequences.

The dam's long-term effect on the ecosystem upon which hundreds of millions depend for their livelihood is the greatest unknown. There is a widespread charge that studies of the dam's environmental impact are as faulty as they are insufficient. It is unclear whether the justifications for such megaprojects are even grounded in economic rationality, let alone environmental sensitivity. And why not multiple smaller dams with sound economic, technical and environmental rationales rather than one humongous project? Ethiopia has not yet answered.

The way forward

While the specter of a global water shortage is real, talk of the Nile Basin becoming the first battlefield in the coming water wars is a bit of a distraction. This does not mean that war over the

Nile is to be ruled out. In fact, despite rampant vulnerability, indeed because of it, the countries may find it impossible to compromise on their maximum demands. To Egypt, water security equals national security. To Ethiopia, the dam has become a matter of national pride. As much as the Aswan High Dam stood as a monument to Gamal Abdel Nasser's quest for grandeur, the GERD symbolizes Zenawi's shot for a place in the history books as well as a ploy to spruce up the ruling party's patriotic credentials. By casting the project as Ethiopia's renaissance, Ethiopia risked that Egypt would see the project as its relapse. Facing water shortages amid a growing population, Egypt has actually been asking to increase its share of the Nile waters to 95 percent.

With positions so widely apart, the risk of conflagration is not entirely rhetorical. However, one thing is clear: The greatest sources of danger staring down at each of Africa's oldest states — Egypt, Ethiopia and Sudan — are internal rather than external.

While realizing that the old status quo that left it with a veto over the Nile's bounties is untenable, Egypt's future lies not in saber rattling but in returning to the aborted revolution's democratic path. Owing to the increasing volatility of the rains, Ethiopia would inevitably need to use its rivers to feed 94 million hungry souls. Devoid of democratization, Ethiopia's regime needs to realize that economic development alone won't resolve the country's woes. At the same time, antagonizing as important a player as Egypt is not in Ethiopia's long-term interest. An Egyptian airstrike can turn the clock back on the dam. Although Ethiopia lacks the means to respond to such an attack in kind, Egypt risks earning the international community's wrath and seeing its relationships with sub-Saharan Africa strained.

Compromise offers the only way out for both. Yet it is likely to be years before a durable peace built on a win-win formula replaces rancor over the Nile. While the latest collapse of talks is a diplomatic circus, it should be noted that dueling regimes, lacking democratic mandates, may indeed overreact to external threats, real or imagined, to win domestic legitimacy. Since a conflagration in the Nile Basin bears global repercussions, the international community must not be oblivious to the inherent dangers.

"Egypt and Ethiopia spar over the Nile", 06/02/2014, online at: http://america.aljazeera.com/opinions/2014/2/egypt-disputes-ethiopiarenaissancedam.html

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❖ Ethiopia's dams: The risks

Egypt has voiced objections to only some — not all — of the dam projects in Ethiopia. But the objections it has voiced are valid, writes **Maghawry Shehata Diab**

The focus on Ethiopia's Renaissance Dam project, which has stirred widespread controversy among the Egyptian public in view of its direct detrimental impact on Egypt, may have distracted us from the question of dams and energy generation in Ethiopia in general. However, Egypt objected to some of the dam projects in Ethiopia.

Ethiopia's energy plans are almost entirely based on capitalising on its many rivers, that flow with varying speeds in various directions, by generating electricity from the dam system that currently exists or that is envisioned for the future. According to studies on Ethiopia's groundwater resources, there are nine "wet" and three "dry" (subject to draught) water basins. The surveys highlight the potential of the "wet" basins, in particular. The most important of these are: Wabi Shebele, Abbay (the Blue Nile), Genale Dawa, Awash, Tekeze (Atbara River), Omo Gibe, Baro Akobo, Mereb.

In addition, the country has numerous subterranean water basins as well as a relatively large annual rainfall: 590 billion cubic metres on the Ethiopian plateau.

The surface area of the water basins varies considerably. The largest are Wabi Shebele (202,220 kilometres squared) and Abbay (199,912 kilometres squared) and the smallest is Mereb (5,900 kilometres squared). At 53 billion cubic metres per year, the Abbay (Blue Nile) River has the highest annual runoff. Its waters flow across the border into Sudan where they meet up with the White Nile and then continue into Egypt. The Abbay (Blue Nile) contributes about 75 per cent of the waters emanating from the Ethiopian plateau (72 billion cubic metres per year), which is why this river is so important to Egypt and Sudan. It is their chief source of water, which underscores the magnitude of the risks inherent in any hydraulic project that could obstruct the flow of these waters into Sudan and Egypt. This explains why these two countries need to be fully reassured that any projects on the Blue Nile are thoroughly studied in terms of their impact on downriver nations, why they should require a consensus, and why Addis Ababa must notify Cairo and Khartoum in advance of any hydraulic works entailing the construction of dams and the diversion of the river course for this purpose, in keeping with the risk aversion principle established in the convention on international watercourses adopted by the UN General Assembly in 1997.

As the Blue Nile is Ethiopia's most important river, in addition to being vital to both Egypt and Sudan, it has become a strategic target for every power interested in throwing a spanner into the

mechanisms of cooperation between these three countries. It is therefore no coincidence that the UN Reclamation Bureau took 1956 as its starting point for an eight-year study of the Blue Nile basin that, in 1964, concluded with recommendations for 33 hydraulic projects on this river. The most important are the following dams: Fincha Amerti Nesse (FAN), Beles, the Renaissance Dam, Mendaia, Beko Abo and Kara Dodi.

Of these, FAN and Beles have been completed, construction of the highly controversial Renaissance Dam has begun and, of course, planning for the Beko Abo and Kara Dodi dams are in progress. Other dams have been constructed or are envisioned for the Tekeze, Omo Gibe and other river basins. In short, a vast Ethiopian dam network threatens to obstruct the current river flow and regulate it through an array of gateways and turbines in a manner that suits Ethiopia's purposes at the expense of its neighbours and partners in the Nile River Basin.

As mentioned in a previous article ("Of dams and droughts," Al-Ahram Weekly, Issue 1181), the Renaissance Dam is the most ambitious project. With a projected reservoir capacity that climbed from 11 billion cubic metres when the plan was originally conceived to 74 billion cubic metres, it is slated to become the largest dam in Africa and the tenth largest in the world. When it goes into operation, it will furnish Ethiopians with seven gigawatts per hour of electricity, enabling Ethiopia to become an energy exporter to its neighbours. They expect their status in this capacity to increase. According to the publicised plans, when the various dams are completed within the next two decades, Ethiopia will be able to produce 15,000 gigawatts per hour, or three times the country's electricity needs.

Yet, a number of geo-engineering, legal and funding problems may hamper the completion of this complex of dams, and the Renaissance Dam in particular. The geo-engineering challenges posed by the Ethiopian plateau are formidable, in view of the precipitous slopes and the solid rock (predominantly basalt) consistency of the upper and middle ranges of the plateau. The site of the Renaissance Dam is located at a relatively low altitude (around 500 metres) and the terrain there and in the vicinity consists of fractured granite rock. Because of the fractures, fissures and faults in this area (Beni Meshgul-Jomez), numerous geo-technical and engineering studies must be undertaken so as to ensure that the proper precautions are taken to ensure the prolonged safety of the dam with its huge mass and with the enormous pressure of 75 billion tons of water behind it. Such studies have not been performed, as has been made explicit in the report of the tripartite technical committee that, in addition to representatives from Egypt, Sudan and Ethiopia, consists of four impartial international

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experts. This report states that the feasibility studies on which the current plan for the dam is based are insufficient and that the current design is not appropriate for a dam of this size. The report also warns that the dam will suffer from silting problems due to the accumulation of sediment in the reservoir, which will gradually reduce its efficiency and overall life expectancy.

The construction of a dam of this size will create an ecological nightmare for Ethiopia, Sudan and Egypt. Seismological studies on the area in which the dam is being constructed speak of repeated tremors and quakes, sometimes reaching six points on the Richter scale. When we add this to the pressures of the mass of the dam structure, the weight of 75 billion tons of water, and the mechanical and chemical effects of the water stored in the reservoir, and the possibility of seepage from the auxiliary dam, we can begin to appreciate the extent of the dangers inherent in constructing a dam of the current specifications.

Failure to address all the negative observations that appear in the tripartite committee's technical report could lead to the partial or even total collapse of the dam, adding unfathomable calamity to the damage that the dam, itself, will cause to the water security of both Sudan and Egypt.

There is no denying that the dam has some advantages for Sudan as well as Ethiopia. In addition to a share in some of the power generating projects, Sudan will be able to put large tracts of land under permanent irrigated cultivation. In addition, areas along the Sudanese portion of the Blue Nile will be safeguarded from the hazards of Nile flooding and the silt accumulation in the reservoirs behind Sudanese dams on that river will be significantly reduced.

However, the risks remain great. Nor have we begun to discuss the material and legal problems entailed in the construction of the Renaissance Dam, which will be the subject of future articles.

"Ethiopia's dams: The risks",Maghawry Shehata Diab, 09/02/2013, online at:
http://weekly.ahram.org.eg/News/5358/21/Ethiopia%E2%80%99s-dams--The-risks.aspx

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❖ Egyptian diplomats storm Ethiopia to smooth relationship

As Ethiopia's 6,000 megawatts hydro dam under-construction on the Nile water continue to be concern for Egypt, forty three young Egyptian diplomats arrive Ethiopia this week to smooth the relationship between the two Nile River sharing countries.

"We as Egyptian never stand against development projects in Ethiopia," said Mohammad Abdelwahad, one of the young Egyptian diplomats currently studying at Diplomatic Institute of Egypt that is financed by Egyptian Ministry of Foreign Affairs.
"If Ethiopia developed projects that will not harm Egypt, we are more than happy to even support by any means," he told http://newbusinessethiopia.com reporter in Addis Ababa, Ethiopia following the media briefing session the embassy organized on February 5, 2013.

The future diplomats of Egypt visit Ethiopia for five days to meet various people and officials in the country and the African Union to prepare themselves for their next diplomatic carrier.

Introducing the young diplomats, "These are bridge builders for the future of our relation," said Mohamed Edrees, Ambassador of Egypt to Ethiopia and permanent representative to the African Union and United Nations Economic Commission for Africa.

"We have also be forward looking to leave for our future generation a recipe for understanding and for cooperation; not a recipe for disagreement and misunderstanding," he said.

The Ambassador noted that decisions related to use of the Nile River for big projects should be done in a collective manner by riparian countries to make things better and better.

International experts' recommendation
Following Ethiopia's government launch of the $5 billion Grand Ethiopian Renaissance Dam (GERD) in April 2011, many Egyptians including politicians have been expressing their concern stating that the dam will reduce Egypt's historical share of the water.

To address the concern, Ethiopia, Sudan and Egypt assigned the International Panel of Experts including external water experts to assess the impact of the dam, which finally handed over its confidential report to the governments of the three countries June.

Now, recommendations of the experts' panel are currently being implemented, according to Ethiopian government statement that followed the report.

"Ethiopia has accepted all the recommendations and suggestions directed to it, and indeed it has already begun to update some of the project documents, and the environmental and social assessment studies," the government's June statement reads.

"It will continue to update other studies to increase the efficiency and cost effectiveness of the project as suggested. It has already begun to respond to the recommendations of the Panel and deal with the engineering aspects of the Dam, concerned with construction detail. Construction will, of course, continue as it is independent of the activities of the Panel."

The experts' view

The statement of Ethiopia indicates that the panel of international experts in their report noted that the Dam will solve the problem of siltation in the dams in Sudan and Egypt, a problem that costs millions of dollars in rectification annually, and produce a more constant water flow.

"The experts were also unanimous in saying that the GERD would solve the problem of the frequent flooding to which the Sudan has been prone. It would reduce evaporation loss, improve water management and enhance rural development in Sudan; and for Egypt it would improve flood control and the flow to the Aswan Dam, reduce evaporation losses by as much as 12%, and by sharply cutting sediment reaching the Aswan Dam, increase its life by up to a hundred years."

Egypt still, not convinced?

Like Ethiopia, Sudan has also accepted the recommendation of the experts, while Egypt still didn't issued official statement so far, according to Fekeahemed Negash, Director at the National and

Transboundary Rivers Directorate at Ethiopian Ministry of Water, Irrigation and Energy who also was member of the panel of experts
representing Ethiopia.

"Egyptian diplomats storm Ethiopia to smooth relationship", 07/02/2014, online at: http://newbusinessethiopia.com/index.php/world/world-news/africa/630-egyptian-diplomats-storm-ethiopia-to-smooth-relationship

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❖ After winning the gorilla war, Rwanda eyes source of the Nile

If there is anything that Levison Wood's River Nile expedition has achieved so far, it is reigniting the debate about the true source of the Nile.

Levison, a British adventurer, is attempting to become the first man to walk the length of the Nile river from its source to the Mediterranean Sea. He wants to outdo the "Ascend the Nile" team, which accomplished the feat by using cars and boats in 2005 and 2006.

The team, which included one woman and five men, one of whom was Cam McLeay, the founder of Adrift Adventure Company, were the first to attempt to outdo John Hanning Speke's work by claiming to have found a "true source of the Nile in Rwanda."

Led by locals, the team that started their journey in Egypt followed Kagera river to its longest point up in the Nyungwe forest. It is this point they declared to be "the longest source of the river Nile," setting the stage for debate about the location of the source of the Nile.

With the help of a GPS, they were able to ascertain the distance between the Mediterranean Sea (near Rashid) to the upper reaches of the Rukarara river deep in the Nyungwe forest. They reported that the Nile is actually 6718km long or 107km longer than it is generally believed to be. No one had attempted to measure the Nile using modern technology like the GPS. Most measurements in the past had consisted of laying a piece of string on a map to find the results.

Now, Levison has stirred the debate further. Accompanied by his friend and guide Boston Bwira Ndoole, who lives in Kampala, Levison, on December 3, 2013, embarked on an ambitious year-long expedition to walk the River Nile from its source to the delta. And his choice of Rwanda as his starting point has once again pitted Uganda against Rwanda as who has the true source of the Nile.

The source of the Nile is an important feature for Uganda's economy. Not only is it an important tourist spot, fetching the country billions of shillings annually. The location of its source will not change the dynamics of the region, but it will at least lead to bragging rights on who owns some of the most important tourist features in the region.

The source of the Nile has held mysteries for thousands of years. The Egyptians sent whole armies to discover its source. But it was not until 1858 when Scottish explorer, John Hanning Speke, settled this debate after encountering a magnificent lake in the heart of East Africa where Kenya, Uganda and Tanzania meet. Naming it Victoria, he proclaimed it to be the fabled source of the Nile at a point he named Rippon falls in Jinja town.

Speke's choice of Rippon falls was convincing. This is because all upstream tributaries pour into Lake Victoria, which has only one outlet at Rippon falls. Also, given the River Nile's volume, only a water source the size of Lake Victoria would qualify as its source. Lake Victoria has a surface area of 68,800 square kilometre and holds 2,700 km3 of water.

However, New Age explorers say Speke was wrong. They claim Rwanda's River Akagera is the largest feeder river to Lake Victoria. That it literally flows through Lake Victoria as the White Nile, contributing about 40% of the outflow from Lake Victoria. But as George W. Magaba, a cartographer with Makerere University explains, a river can't be the source of another river.

"A river is never a primary source of water; water just flows through it," Magaba says.

According to the Nile Basin Initiative (NBI) website, the major supplier of river Akagera water is Ruvyironza river in Burundi. It, therefore, becomes intriguing that it is Rwanda, instead of Burundi, that is being considered to have the true source of the Nile. Rwanda, which is about the size of Karamoja sub-region, has aggressively marketed itself as a tourist destination, investing $5m annually into marketing its country compared to Uganda's $300,000.

Today, the country with just three national parks has sandwiched Uganda, selling itself to the world as the home of mountain gorillas when in fact more than half of them are found in Uganda. Rwanda's naming of gorillas (Kwita Izina) brings in thousands of tourists, while Uganda's Friend a Gorilla campaign didn't live to see its first birthday.

Could Rwanda be seizing another opportunity to upstage Uganda on another front?

"Rwanda is simply seizing a marketing opportunity and Uganda tourism is sleeping," says renowned journalist Charles Odoobo Bichachi. "Kenyan companies market Kilimanjaro as being in Kenya because true you can see it while across the border in Kenya."

The source of the Nile in Jinja, which was recently ranked among the seven natural wonders of Africa, remains largely unattended to –with dilapidated structures. Many Ugandans are suspicious of Levison's motives.

"I wonder if he [Levison] got clearance from government and if those at the Tourism ministry who are concerned with the image of our country reviewed and understood the objectives of his exploration," says Abiaz Rwamwiri, the communication officer of the African Wildlife Foundation (AWF) Uganda, pointing out that Levison went to Mama Fiina (a traditional healer) to be bathed with milk. "The fact that he had a following of an international media, he should not have been treated as a tourist but due diligence should have been done to avoid any negative portrayal."

Rwamwiri says the ministry should have been able to crosscheck if Levison had sinister motives by choosing Rwanda as his starting point. Levison's journey is being filmed for a four-part Channel 4 series to start broadcasting this year, and he has attracted international attention.

Professor Oweyegha-Afunaduula, who once served as the chairman of the Nile Basin Discourse (the umbrella civil society organization for all the NGOs in the 11 countries that form the Nile basin), says the Nile is a product of the entire Nile basin region.

"The Nile gets water from various sources; that is why we are referred to by three names: Nile basin countries, Great lakes region and watershed area," he explained.

Oweyegha-Afunaduula said the debate about the source of the Nile has neither novelty nor substance. It is a point echoed by Bichachi: "This is a matter of conjecture, not fact. It is largely to nourish the adventure spirit of today's explorers who want live experience of walking in African jungles."

"After winning the gorilla war, Rwanda eyes source of the Nile", 04/02/2014, online at: http://www.observer.ug/index.php?option=com_content&view=article&id=29960:-after-winning-the-gorilla-war-rwanda-eyes-source-of-the-nile&catid=38:business&Itemid=68

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❖ Japanese encephalitis incidence during Three Gorges Dam construction investigated

Changes in temperature and rainfall were key variables in the incidence of Japanese encephalitis in the areas near China's Three Gorges Dam between 1997 and 2008, according to recent study findings.

In the study, researchers gleaned data from three geographical regions (East, Middle and Western regions) in Chongqing, China, along the Yangtze River, consisting of 12 districts.

They analyzed dimensional patterns ofJapanese encephalitis virus (JEV) spread by calculating the annual occurrence for each of the 12 districts, each of the three regions, and the entire area from 1997 to 2008. From this, they determined monthly incidence of JEV for each region and district, and charted epidemic curves for the three regions. This information was used to establish the JEV patterns between 1997 and 2008. Using the population of each area at a given time period, the researchers calculated the incidences for each district, each geographic region, and the total area. The investigators then used Zero-Inflated Poisson Regression models to establish the climate-related variables affecting JEV transmission in the entire study area and each region, and used linear regression to determine climatic variations during the period spanning the Three Gorges Dam construction. The dam was completed in 2012.

The study found that throughout the entire city of Chongqing, the occurrence of JEV was reduced between 1997 and 2008, with notable fluctuations seen in 2000, 2001 and 2006. The highest incidence of JEV was observed in the eastern region, which is in closest proximity to the Three Gorges Dam. The western region had the lowest incidence. Seasonal climatic variations during this period were discovered via linear regression models. According to the models, there was a significant positive correlation between temperature (with a 1- to 3-month lag) and incidence of JEV, and a significant inverse relationship between rainfall (with a 0- to 4-month lag) and JEV occurrence.

The researchers said the overall decrease in JEV occurrence may have masked any harmful effects of dam construction on climate fluctuations and JEV.

"The effects of dam construction on the changes of climatic variables and in turn on the JE incidence must be further studied," the researchers wrote. "At least by now, the negative impact of [Three Gorges Dam] on [Japanese encephalitis] incidence might be too slight to neutralize the positive effects of improved sanitation and economic development in Chongqing."

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"Japanese encephalitis incidence during Three Gorges Dam construction investigated", 05/02/2014, online at: http://www.healio.com/infectious-disease/vaccine-preventable-diseases/news/online/%7Bc818d938-0cd0-47bf-b761-15932ac47dc9%7D/japanese-encephalitis-incidence-during-three-gorges-dam-construction-investigated

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❖ Thirsty energy: the conflict between demands for power and water

Water scarcity and poor hydro management can threaten energy production. A World Bank initiative aims to tackle the problem

The UK's climate change minister Greg Barker and Nobel Laureate Kofi Annan will be among those meeting in Delhi this week to try to get to grips with one of the most pressing issues of our time: how to solve the conflict between the globe's spiralling need for energy and access to water on a planet that is coming under increasing water stress.

Almost all sources of energy, including many renewable ones, require large amounts of water to produce and in India, the trade-off is stark. India wants to expand its grid to the third of rural population with no access to power, yet existing power production is often undermined by poor water management and drought. A year ago the state of Maharashtra had to shut down all six units of a 1130MW thermal power plant after water levels in the dam fell to critically low levels.

Diego Rodriguez, senior economist in the World Bank's water unit, says India is not alone. In the US, several power plants have had to rein in production due to low water flows or water temperatures too high to cool plant. France periodically is forced to cut back nuclear power production, and hydropower production in Sri Lanka, China and Brazil have all been compromised by lower water levels caused by drought.

And the situation is predicted to get worse as rapidly expanding economies and more extreme weather conditions squeeze the world's limited water resource. By 2035, the World Bank says, global energy consumption will increase by 35% while water use for energy will go up 85%. For the first time last year, the International Energy Agency's World Energy Outlook included a section on water, and warned that water constraints "can challenge the reliability of existing operations and the viability of proposed projects".

At the Future Energy Summit in Abu Dhabi last month the World Bank launched its Thirsty Energy initiative to try to help countries manage the "water-energy nexus". It is aimed squarely at the energy community, Rodriguez said, because the conventional approach of tackling it from the water perspective has not worked. "We always go from the water perspective, but if you see the minister of energy sitting beside the minister of water resources, it is pretty clear who will win in any debate."

Rodriguez says the World Bank is offering to send in a core team to help countries integrate their water and energy planning. In most countries there is little joined up thinking about energy and water availability at the planning stages. "A country's [water resource] is divided by watersheds while energy is divided by national, regional and sub-regional grids."

Future expansion plans for the energy sector rarely internalise the cost of building infrastructure such as canals and pumping stations to supply water. Nor do they take into account the environmental and social impacts of water use by power plants, he says. "Even if you don't consume the water, if you abstract it and discharge it at a different temperature there will be a potential impact on the ecosystem."

South Africa has been experimenting with dry-cooling technologies in power plants, but these use more energy to run, and are two to four times more expensive.

And it is not only fossil fuel plants that need water for their cooling processes. Of the renewable sources, only wind power and photovoltaics use negligible amounts of water. Morocco last year awarded contracts to a Saudi consortium to build a 160MW concentrated solar power plant in the desert at Ouarzazate, with another 300MW planned. Rodriguez points out that CSP requires large amounts of water to keep the mirrors clean.

"We must understand the trade-offs. You can't look at the water and energy sectors in isolation anymore," Rodriguez says. "You need to have constant feedback between the two."

This week's conference in Delhi is only one of many this year that will highlight the issue. Global Water Intelligence, organisers of a global water summit in Paris in April, says water risk is the biggest challenge the global economy faces. It predicts that in the next 10 years everyone on the planet will "experience a water related event – a shortage, a flood, an infrastructure failure, an interruption to business, an economic disruption – which will have a bigger impact on our lives than we have ever experienced before."

"Thirsty energy: the conflict between demands for power and water", 06/02/2013, online at: http://www.theguardian.com/sustainable-business/thirsty-energy-conflict-energy-demand-water-access?CMP=twt_gu

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❖ Water in Beijing Scarce, and Getting Scarcer

According to China's Legal Evening News, Beijing has been low on water since 1999 and has now experienced a severe water shortage for several years.

Beijing requires an average of 3.6 billion cubic meters of water annually, while water sources provide only 2.1 billion cubic meters, resulting in a shortage of 1.5 billion cubic meters of water each year.
By international definitions, water scarcity is defined as less than 500 cubic meters of water per person per year. The annual water supply in Beijing totals less than 100 cubic meters of water per person, making Beijing's water shortage worse than that of the Middle East and North Africa.

In the past, Beijing had an abundant supply of water from the five rivers that flow through the city. Yongding River, one of the main tributaries in the Hai River system and best known as the largest river to flow through Beijing Municipality, has now dried up.

In an attempt to eliminate the shortage, Beijing began turning to underground water and reservoirs. Overexploitation eventually drained these sources as well, making the transfer of water from other regions the only remaining choice.

Water Transfer

Billions of dollars have been spent on the South-North Water Transfer Project over the years. However, according to Beijing Water Authority deputy director Liu Bin at a recent press conference, even 1 billion cubic meters of water from the south each year is insufficient to eliminate the severe water shortage in Beijing.

Water conservation ecology expert Wang Weiluo from Germany told Sound of Hope radio network that water scarcity in Beijing is a manmade disaster that began following the Chinese Communist Party taking over in 1949.
He says that Mao's decision to construct a water reservoir for Beijing had intercepted 1.4 billion cubic meters of water from the Yongding, causing drying and pollution.

Wang says that there is no data on the feasibility study of the South-North Water Transfer Project and that it was initiated simply based on the words of Mao Zedong.

When Mao visited the Yellow River in 1959, he suggested "borrowing" 100 billion cubic meters of water from the south—twice the amount of the water in the Yellow River. Wang says that Mao's suggestions were purely based on an impression and were not backed up with any research or data.

When China was given permission to host the 2008 Olympics in Beijing, Jiang Zemin initiated the middle route of the South-North Water Transfer Project in the name of bringing clean water to Beijing for the Games. Over five years after the Games ended, no water has passed through. Beijing has been receiving water transferred from nearby Hebei Province since 2008.

There is another factor involved in Beijing's water shortage: the predominance of Beijing in China.

According to Beijing human rights lawyer Tang Jitian, China is setting Beijing up for disaster by centering all of its efforts and resources on Beijing alone. As other regions are deprived of resources and opportunities for development, their workforce migrates to Beijing, resulting in an expanding population that takes a toll on Beijing's natural resources. At some point, Beijing's expansion will reach a point where resources are simply unavailable, according to Tang.

"Water in Beijing Scarce, and Getting Scarcer", 06/02/2014, online at: http://www.theepochtimes.com/n3/490688-water-in-beijing-scarce-and-getting-scarcer/?photo=3

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❖ Chinese-built largest dam in Cambodia starts testing operation

The Lower Russei Chrum River hydroelectric dam, which is the Cambodia's largest hydropower plant, has begun testing operation after it has been constructed for three and a half years, a company's official said Saturday.

The 338-megawatt hydropower dam, situated in the jungle in Mondol Sima district of southwestern Koh Kong province, was developed by the giant power company China Huadian Corp for a cost of 500 million US dollars under a 35-year build-operate-transfer contract.

Under terms of the agreement, the plant sells power to the state-owned Electricity of Cambodia.

Le Jianhua, deputy general manager of China Huadian Lower Russei Chrum River Hydroelectric Project Company, said the firm has completed the construction of the dam nine months earlier than the schedule.

He said the dam has two reservoirs and four generators.

"We have tested the operation since December last year. Up to now, the plant has supplied 190 million kwh to the Electricity of Cambodia," he told reporters, adding that the dam is capable to generate the power of 1 billion kwh per year.

"It is the first-ever largest hydroelectric plant in Cambodia at the moment," he said.

Cambodia has a serious shortage of power facilities. Only about 35 percent of its households have access to reliable electricity, according to the Ministry of Mines and Energy.

"The operation of the dam will contribute to developing economic activities and further reduce electricity shortage in Cambodia," Le Jianhua said.

China is the largest investor in building hydroelectric dams in this Southeast Asian nation. According

to the Ministry of Mines and Energy, Chinese companies have invested over 1.6 billion US dollars to construct six hydroelectric dams with the total capacity of 928 megawatts in Cambodia.

To date, four dams have come into operations, and the remaining two dams are expected to be completed the construction by next year.

"Chinese-built largest dam in Cambodia starts testing operation", 09/02/2014, online at: http://www.globaltimes.cn/content/841301.shtml#.UvtrGGJ_sbB

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❖ Water and Energy

The main theme for all water-related events in 2014 was designated to be the "relationship between energy and water". Within this framework, the World Water Day to be held on March 22nd, 2014 and the 2014 World Water Week in Stockholm will focus on the relationship between energy and water.

While water is used to cool thermoelectric and hydroelectric power plants, produce fuels, and extract and refine oil; energy is used to extract, treat and transport water. Water and energy are required for crop production, while bio-fuels are used for energy. There is an interdependence between water and energy. Energy security and water security are important factors in terms of the humanitarian and economic development. Therefore, scarcity of both resources will cause problems in the forthcoming period.

In a world population of 7 billion people; 2,5 billion people lack access to electricity, and 2,8 billion people live in the areas where water shortage prevails. It is envisaged that energy consumption will go up by 35 percent and water consumption by 85 percent by 2035. According to the World Energy Outlook 2012 Factsheet, global freshwater use for energy production in 2010 totalled 583 billion cubic metres (bcm), or 15% of the world's total water use. 66 billion cubic metres of water used for energy production does not return to its source. It is estimated that water use will increase at a rate of 1/5, while water consumption (the amount that does not return to its source) will rise by 85% by 2035.

There will be a considerable use of water resources in extracting recently known resources especially such as shale gas in the forthcoming period. Also, the intensity of water use in Canadian oil sands production and maintaining reservoir pressures to support oil output in Iraq attracts attention.

Energy demand and water demand are directly proportional. As it is concerned that water's becoming a scarce resource with each passing day could turn the interdependence into a vicious circle, it is of great importance for physical, economic and environmental sustainability of energy projects. Establishing water and energy security is prerequisite for sustainable development.

The Middle East and North Africa (MENA countries) are among the regions most at risk. The region has 66% of the world's known crude oil reserves, but only 1.4% of the world's fresh water supplies. Most MENA countries produce more oil than they use except for Morocco, Turkey, Israel, Jordan, and Palestine. Figures related to amount of water used for energy in the region are mentioned in certain studies. For example, according to figures suggested by Mielke in 2010, while 281,93 liters of water is used to extract 1 million BTU (British Thermal Unit) / 293 thousand Wh of oil; while 46,76 liters of water is used to refine 1 million BTU (British Thermal Unit) / 293 thousand Wh of oil. 1439 liters of water is used for 1MWh in a steam turbine for one-time cooling.

The relationship between water and energy will be of greater importance in the upcoming years. The water-scarce regions especially such as MENA countries will have to import water or resort to inter-basin water transfer, to use groundwater or reuse waste water, and to treat seawater and hard water.

*Data mentioned without reference is quoted from World Bank.

"Water and Energy", Tuğba Evrim Maden, ORSAM, 06/02/2014, online at:
http://www.orsam.org.tr/en/WaterResources/showAnalysisAgenda.aspx?ID=2596

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❖ Solar Water Pumps Wean Farmers From India's Archaic Grid

India has a novel idea: Wean farmers from archaic **power lines** and expensive **diesel fuel**to run their water pumps with solar energy.

The government is looking to swap 26 million groundwater pumps for more efficient irrigation models powered by the sun. If successful, crop production could rise in India, where farms suffer from blackouts and volatile fuel costs. It would also save about $6 billion a year in power and diesel subsidies.

Companies targeting the market include **BlackRock Inc (BLK)**.- backed **SunEdison Inc. (SUNE)**, **Asia**'s top irrigation-equipment maker **Jain Irrigation Systems Ltd. (JI)**, Claro Energy Pvt., whose investors include Standard Chartered Plc Managing Director Arun Singhal, and the solar unit of the **Tata group**, India's biggest conglomerate.

"The potential is huge," Tarun Kapoor, joint secretary at India's Ministry of New and Renewable Energy, said in an interview. "Irrigation pumps may be the single largest application for solar in the country."

Asia's second-most populous nation will draw 100 billion rupees ($1.6 billion) of investment in the next five years as the first 200,000 most easily replaceable pumps are switched to solar, the government estimates. That will relieve an overburdened power-transmission grid built mostly in the 1960s that's prone to failures.

A risk in converting to solar pumps is that farmers may use excessive amounts of water because the devices have almost no operating costs. To avoid that, farmers must use water-saving drip irrigation in exchange for accepting subsidies to buy solar water pumps.

One who has already seen the benefits of switching over is O.V.R. Somasundaram, a 67-year-old who grows coconuts, nutmeg and cocoa in southern India. He invested two years ago in a solar pump from St. Peters, Missouri-based SunEdison.

Snake-Bite Risk

Somasundaram's 75 acres of farmland in Coimbatore, **Tamil Nadu**, used to be dependent on electricity from the state, sometimes only available four hours a day from an antiquated grid. When the power came on, it was often at night, meaning workers risked snake bites as they wandered into dark fields.

"Crops need water," he said in an interview in Chennai. "My crops would have failed if I hadn't opted for a solar pump."

Somasundaram now gets water when he needs it, throughout the year when the sun is out, and without the fuel costs of a diesel generator. He irrigates a third of his holdings with the system, which cost 400,000 rupees after 60 percent was subsidized.

'Break Link'

The new water reliability from a technology that moves away from older energy sources will allow him to plant an extra crop, black peppers. About 3,000 saplings are to be sowed by March.

Using fossil fuel-based power to pump well, canal and farm water also contributes to **climate change**, said Aaron Mandell, chairman of **WaterFX**, which sells solar desalination technology.

Let's "break the link between carbon-based fuels and additional water production," Mandell said. "The best way to do this is for the water industry to begin to take advantage of the cost reductions that have already occurred in **renewable energy**."

The cost of photovoltaic panels that have **slumped by half** since 2010 and government subsidies mean the payback period of a solar pump system is one to four years, said Ajay Goel, chief executive officer of Tata Power Solar Systems Ltd., a panel maker and contractor that belongs to the $100 billion Tata group, which has businesses including steel, software services and vehicles.

Eliminate Subsidies

The government funds in some states as much as 86 percent of the cost of solar pump systems that in the long run save money because they eliminate $6 billion in annual farm diesel and electricity subsidies, according to Kapoor. That aid helped nudge India's current-account deficit to a record last year.

The economics will only get better as diesel prices rise and scale brings more efficiencies, eliminating the need for state support, said Stephan Grinzinger, head of sales for Lorentz Vertriebs GmbH, a German maker of solar water pumps.

"Because of the drop in photovoltaic prices, globally we're selling more solar pumps without subsidies than with," Grinzinger said. Lorentz operates in 130 countries, he said.

The change comes as production of mainstay crops like wheat, corn and rice stagnate in India, according to a **2012 study** of nearly five decades of yield data published by the journal Nature Communications. The reasons included water scarcity and falling groundwater tables.

Farmers needing cash for diesel will often promise their harvest upfront to pay for the fuel, agreeing to low prices for their crops. As water demand rises during the growing season, diesel prices spike on the black market.

Largest Blackout

In 2012, farmers were forced to run electric pumps after a bad monsoon contributed to the world's biggest blackout that left almost 360 million people in the dark for days, according to the World Resources Institute.

About 8 million diesel pumps already in use could be replaced economically now, said Pashupathy Gopalan, SunEdison's regional head. The ministry's Kapoor estimates another 700,000 diesel pumps are bought every year in India that could be displaced with solar.

"It's a phenomenally strong growth market for solar energy," said Gopalan of SunEdison, the world's**second-biggest contractor** of photovoltaic plants, according to **IHS Inc. (IHS)** The company introduced a solar water pump in India in November.

Revenue growth from the solar business at Jain Irrigation has outpaced its food and irrigation products by more than double since 2009, according to its annual report. Jain spokesmen didn't respond to two e-mails and a phone call seeking comment. Jain climbed as much as 2.5 percent to a two-week high today and closed up 0.8 percent to 63.50 rupees in Mumbai. The benchmark S&P BSE Sensex advanced 0.3 percent.

Funding Growth

Claro Energy plans to raise additional funding this year as it quadruples installations to more than 1,300 pumps, Director Soumitra Mishra said by e-mail.

Solar pumping may have far-reaching impacts on agriculture in India, where monsoon rains dictate sowing cycles of crops such as rice, soybeans and peanuts, said Avinash Kishore, an associate research fellow at the **International Food Policy Research Institute** in **New Delhi**.

In the fertile east, solar pumping could reduce floods and boost rice and wheat harvests, said Tushaar Shah, a senior fellow at **Colombo**, Sri Lanka-based International Water Management Institute.

'A Godsend'

In water-stressed regions including Rajasthan, home to the biggest state solar-pump program, the project is unique in scale, with larger private farmers looking to exchange grid and diesel systems.

"For a single country, a single program, this is the largest project in the world for solar pumps," Grinzinger of Lorentz said.

Yet it may also encourage farmers to overdraw water because the cost of running the sun-powered machines is negligible.

"You have to be careful. All sorts of possibilities come up as costs come down," Shah said. "For water-abundant, especially flood-prone areas of eastern India, solar pumps can be a godsend."

"Solar Water Pumps Wean Farmers From India's Archaic Grid", 07/02/2013, online at:
http://www.bloomberg.com/news/2014-02-07/solar-water-pumps-wean-farmers-from-india-s-archaic-grid.html?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=2c79216bb3-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-2c79216bb3-250657169

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❖ Report: Large Water Resources Lie Untapped In Indiana Mines

A report from the Indiana Geological Survey estimates up to 172 billion gallons of untapped water is being held in the state's underground mines.

There could be enough water sitting in Indiana's abandoned underground mines to fill Lake Monroe three times, according to a new report from the Indiana Geological Survey.

Researchers estimate 172 billion gallons of untapped water is being held in the state's underground mines, and the water in them is not like most of the state's water that's buried in porous rocks and difficult to extract.

"Within these underground mines, you actually do have free flowing pools of water, so you could actually withdraw quite a bit of water within a short period," says Denver Harper, a retired coal geologist at the Indiana Geological Survey whose data was used in the report.

But researchers would also have to make sure there's a way to replenish the water pools.

The water is also not likely clean enough for everyday use.

"There is water in these mines and it could be used for industrial purposes or some other purpose but as a direct groundwater source, It's probably not a supply for drinking water purposes," says Jack Wittman is a hydrogeologist at the geosciences and engineering consulting firm INTERA.

One of the biggest possible contaminants, Haper says, is sulfur. Indiana coal has a high concentration of sulfur, which has likely seeped into the water during the mining process.

Companies could clean the water, but doing so likely would not be economically viable while there are other water resources across the state that haven't been used.

There is also the question of legal rights. Mining companies often still often own mineral rights on the property, which means they could have to sign off on any use of the water.

Wittman is putting together a comprehensive report of the state's water resources for the Indiana State Chamber of Commerce. He plans to include the mine water in his analysis but says he would not consider it a major option until many years down the road.

However, Vince Griffin, Vice President of Energy and Environmental Policy for the Indiana Chamber of Commerce, says people who represent the mineral industry, including limestone quarry and coal companies, are being included in the discussion about how Indiana should manage its water resources.

Griffin also says the new sections of Interstate 69 from Evansville to Bloomington is increasing the demand for water resources along the route, which could exacerbate the need to utilize the water in the mines that are heavily concentrated in southwest Indiana.

"The aquifers in the southwestern part of the state and specifically along the I-69 corridor are very challenged to have good water supply, but if those coal mines are in that area, that level of water and the treatment of that water might become more of a possibility when you look at where you are going to go," Griffin says.

"Report: Large Water Resources Lie Untapped In Indiana Mines", 05/02/2014, online at:
http://indianapublicmedia.org/news/report-water-resources-lie-untapped-indianas-mines-62538/

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❖ World Bank eyes $1 billion African resource mapping fund in July

(Reuters) - The World Bank wants to launch a $1 billion fund in July to map the mineral resources of Africa, using satellites and airborne surveys to fill geological gaps across the continent where a lack of adequate data hampers mining investments.

The World Bank has committed $200 million to the five-year fund, and was meeting with mining companies and governments from sub-Saharan Africa who have expressed interest, a senior bank official told Reuters on Wednesday.

"Times are tough, so the mining companies are counting their pennies, but there is a lot of interest because it is exactly when commodity prices are low and the companies are reducing their investment budgets that having the information to guide their priorities is valuable," said Paulo de Sa, senior manager at the World Bank's mining unit.

De Sa met with 10 mining companies on the sidelines of an African mining conference, including Rio Tinto and Ivanhoe Mines, who were interested in the fund.

Initially targeting southern and eastern Africa, De Sa said the fund would aim to collate existing data onto a single, digital platform that would be accessible to the public.

Besides helping to guide exploration investment, African governments could benefit by being able to negotiate better deals when handing concessions to mining companies, he said.

"If they know what they have in their territory, they are in a better position to fine-tune and calibrate the fiscal regime and mining laws," De Sa said.

When Mozambique, for example, privatized its giant Moatize coal mine, it did not know the true potential of the coal basin until Brazilian miner Vale started exploration work.

De Sa said the bank, which has received expressions of interest from Malawi and Mozambique to assist with geological mapping, hoped to identify copper prospectivity in Zambia, Africa's top producer of the metal.

"There is a lot more copper in Zambia than what is known, so we hope to identify the areas with more prospectivity and then the government will be able to attract more investment to areas because they know there will be a lot more certainty, a lot less risk," he said.

The data could also be used by governments when planning infrastructure development or water resource allocations.

De Sa said the mapping fund hoped to unearth up to $1 trillion worth of new mineral resources on the continent.

"World Bank eyes $1 billion African resource mapping fund in July", 05/02/2014, online at: http://www.reuters.com/article/2014/02/05/us-africa-mining-mapping-idUSBREA140LT20140205?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=29647026de-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-29647026de-250657169

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❖ PR – World Bank Indefinitely Postpones Inga 3 Project

Pretoria, South Africa: The World Bank has just made a surprise decision to indefinitely postpone the board discussion of its support for the huge Inga 3 Dam in the Democratic Republic of Congo. The Bank's board of directors was scheduled to vote on February 11 on a US$73 million grant to prepare for the project. Opposition from local and international NGOs has been mounting, and civil society groups are now urging the Bank to fundamentally reconsider the Inga 3 project.

As proposed, the Inga 3 Dam would generate power for mining companies and the South African market, not for the more than 90% of the DRC population that has no access to electricity. In a letter to the World Bank, a coalition of 12 Congolese NGOs asks that the needs of the local population be prioritized in a comprehensive assessment of the country's energy needs and options. If the Inga 3 Dam were to go ahead, they state, at least 50% of the power generated by the dam should serve the energy needs of the population.

Danny Singoma, Executive Director of the Congolese NGO CENADEP, comments: "The project assumes that the revenues from the power exports will benefit local people. These kinds of development have never worked in our country, where there is so much corruption and no accountability to the citizens by those in power."

The DRC has a large potential of clean local energy sources such as solar and micro-hydropower. Rudo Sanyanga, Africa Program Director for International Rivers, comments: "Decentralized energy is the only feasible way of meeting the energy needs of the majority in such a vast country with limited capacity for maintaining huge infrastructure. It is time to move quickly to develop these resources, rather than destructive mega-hydro plants."

In a briefing paper, International Rivers documents how the Environmental Impact Assessment that would be carried out under the proposed World Bank grant falls short of good international practice and the Bank's own guidelines. Most importantly, the Bank has indicated it is not prepared to assess the cumulative impacts of the 11 dams and six hydropower projects that are planned under the Grand Inga scheme. Such short-sighted approaches to dam cascades have caused the death of critical ecosystems by a thousand cuts in the past.

Peter Bosshard, Policy Director of International Rivers, says: "The proposed Inga 3 Dam fails to reduce energy poverty and protect the environment in the DRC. The World Bank should use the project's delay to fundamentally reconsider the value of Inga 3 and prioritize the clean local energy solutions that are more effective at reducing energy poverty."

The Inga 3 Dam is the first phase of the giant Grand Inga project on the Congo River, the largest hydropower scheme ever undertaken on the planet. Inga 3 is projected to cost $12 billion and have a capacity of 4,800 megawatts if completed. The US budget bill that was passed by Congress in January instructs US representatives in multilateral development banks to oppose large hydropower dams such as Inga 3.

"PR – World Bank Indefinitely Postpones Inga 3 Project", 05/02/2014, online at:
http://www.internationalrivers.org/resources/pr-%E2%80%93-world-bank-indefinitely-postpones-inga-3-project-8223?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=44632f29fd-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-44632f29fd-250657169

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❖ Firm to launch water treatment solution

MANAMA: Australian-made Care-Free Water Conditioners has announced the official launch of its natural water treatment solution for the Middle East market at the Gulf Industry Fair.

"The Gulf Industry Fair will provide the launch pad for "this revolutionary product that has already made waves in Australia, the US, UK, New Zealand, Spain, India, Korea and other countries," a company statement said.

Care-Free Water Conditioners is brought to the Middle East market by Bahrain-based Vineyard Group.

The group has carved a well-established reputation for its commitment to quality and in delivering cost-effective products and services that match clients' specific requirements.

The Vineyard Group has branches in Saudi Arabia, the UAE, UK and the Indian Subcontinent.

"It is a great privilege for us to be able to launch Care-Free Water Conditioners at the Gulf Industry Fair where we should be able to meet and interact with potential clients spread across the entire Middle East," Vineyard Group operations director Jerin George Mathew said.

"For more than 30 years, Care-Free Water Conditioners has held several unique patents for reducing salinity in the soil and increasing the quality of water supply.

"This natural water treatment system is installed into the pipeline to assure continuous and unlimited supply of water.

"There are no moving parts to wear out or cartridges to replace. And if properly maintained, they are expected to last a lifetime.

"We are confident that this revolutionary natural water treatment system will prove to be a simple, safe and cost-effective water problem solver for residential and industrial users," he added.

Care-Free water conditioners are manufactured with heavy duty commercial and marine grade 316 solid stainless steel for trouble-free performance and prevention of corrosion, scale deposition and algae formation. It has proved effective for wide range of users that includes householders, farmers, gardeners, golf courses, resorts, hotels, spas, commercial outlets as well as industrial concerns.

"Firm to launch water treatment solution", 04/02/2014, online at: http://www.gulf-daily-news.com/NewsDetails.aspx?storyid=369925

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❖ Dam Development: Taib's govt 'ignoring' SEIA

KUCHING: Chief Minister Taib Mahmud's disclosure of a 'revised programme' to hasten the construction of more dams to meet impending energy demands of the industries in Sarawak Corridor of Renewable Energy (Score) has come as no surprise to a local coalition of NGOs here.

Save Rivers chief, Peter Kallang said it was typical of the state government to "totally ignore" international standards and push through the construction of the dams.

"I am not surprised…the state government totally ignores international standard such as Free, Prior and Informed Consent (FPIC) as stated in the United Nation Declaration on the Rights of the Indigenous Peoples (UNDRIP) which Malaysia is a party to.

"It finalises decision for building the dam even before the results of the SEIA (Social Environmetal Impact Assessment) is even known … the state government doesn't take the SEIA seriously," he told FMT.

He said it is a known fact that the state government is on a building spree and is adamant about constructing the 12 hydro-electic power (HEP) dams irrespective of the need and consequences.

To underscore his view he cited Murum dam project manager Andrew Pattle's comment in his company annual report in 2011 stating "safety and environmental complaince are not given as much importance here".

"From the Chief Minister's (recent) remark (in the media) we can see that the focus is on dam building and not on the welfare of the people or the state, not the environment nor the common good for Sarawakians," he said.

Refering to latest reports on Bakun's reduced output, Kallang asked what was the hurry to build more dams when the Murum impoundment process had also begun.

"The latest revelation about the Bakun Dam is that out of the eight turbines installed for the HEP, seven are already commissioned but only six are in operation.

"But each of the six units are running at half load, i.e. 150 MW while each is rated at 300MW. One of the eight units are down for maintenance.

"If the CM says there is a huge demand for power than why are the six turbines in Bakun not running in full capacity?

"Why is there no hurry in commissioning the one unit (which is down for maintenance)?

"When the impoundment of Murum is complete there will be an additional of 944MW installed power which will again add up to the excess installed capacity.

"What is the big hurry in building more HEP?

"Somebody seems to be either out of touch with reality or purposely misleading the public for their own agenda," Kallang said.

"Dam Development: Taib's govt 'ignoring' SEIA", 05/02/2014, online at:
http://www.freemalaysiatoday.com/category/nation/2014/02/05/dam-development-taibs-govt-ignoring-seia/

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❖ Drought should make state rethink water policy

With the arrival of a few raindrops, Californians already may want to put aside efforts to reduce water use by 20 percent as the governor asked when he declared a drought emergency last month. Change is hard; no one likes the idea of trying to do with less. Yet we need to use this drought emergency to rethink how we allocate water in the state.

This year is still one for the records. The driest winter, after a dry winter. The lowest storage levels seen in many reservoirs around the state, especially in the north. The thinnest snowpack. The first time in 54 years that the State Water Project, which supplies water to 25 million Californians and irrigates hundreds of thousands of acres of farmland, has promised no water allocations, with some small exceptions.

Drought is a product of nature, but some think the drought emergency is the result of mismanaged water resources. With Shasta, Oroville and Folsom reservoirs full last spring in what was already shaping up as a second dry year, the state increased pumping to water districts in the San Joaquin Valley and Southern California rather than decreasing pumping as planned. "Droughts are known; emergencies happen when people ignore facts and overpromise water supplies," said Barbara Barrigan-Parrilla, executive director of Restore the Delta.
It's better to think of the drought emergency as the inevitable result of 100 years of California water policy.

Drought is always part of California living - we just haven't adapted to it, instead basking in making the desert bloom. Now we must, because we have run up against the limits of our water supply.

Historical records suggest the past century was unusually wet for the West and the coming century may be drier. And, the climate is changing.

For most of California's history, state water policy has focused on supply. We struggled over how to store water, move water, divvy up water among competing entities who claim rights to the water. These battles won't produce more water.

We need to focus on demand.

In California, water in rivers and lakes is managed separately from water under the ground. In "rich years," as John Steinbeck called them, this went unheeded. In dry years, the neighbor's well went dry when a grower overpumped the groundwater. Such pumping was legal, but set off feuds. Today, land in the San Joaquin Valley is sinking - in some places by as much as 28 feet - because of extensive pumping of the aquifers. The U.S. Geological Survey says subsidence is threatening the Delta-Mendota Canal, a key part of the state's water delivery system.

We need to change state law. Surface water is managed as a public benefit; groundwater is treated as a private good. Yet water above and below the ground is all part of the same water system. The Legislature must pass a comprehensive statewide groundwater law.

Dry years typically bring calls to take water from "the fish," and this year is no exception. But if cities or farms tried to take water from another agency, we'd consider it theft. A consortium of water experts has suggested that cities and farms should have to buy water made available by dropping environmental standards. Nothing moderates demand as well as price.

The revenue would go to the state to spend on fish and wildlife recovery or to buy water in other parts of the state for the environment. And such a plan would meet the state's much-touted "co-equal" environmental and economic goals for water management.

It will take political courage and persuasion - and investment - to reshape how California manages water. What we can't do is just wait and say we hope it rains.

"Drought should make state rethink water policy", 07/02/2014, online at:
http://www.sfgate.com/opinion/editorials/article/Drought-should-make-state-rethink-water-policy-5215327.php

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❖ The Costs of California's Bellwether Drought: What Can We Expect

The simplest definition of "drought" is that there is less water than we would like to do the things we want, from watering farmers' fields to providing for urban needs to sustaining ecosystems. The costs of drought vary widely from sector to sector, and often include things that are hard or nearly impossible to measure or to quantify.

As a result, it is difficult to report on drought costs in a comprehensive or consistent way. And until a drought ends, it is impossible to know the ultimate costs. California is in severe drought now.

As California's "Bellwether Drought" continues, however, here are some of the things we need to pay attention to:

Energy: A drop in California hydroelectricity production is an inevitable outcome of reduced water availability. Because hydroelectricity is relatively cheap to produce, and highly valuable since it can be used to meet "peak" demands, California consumers will pay more for energy during droughts when hydropower is replaced with other, more expensive supplies. A 2007-2009 drought in California, for example, cost consumers around $1.7 billion more in energy bills. In addition to these direct costs are the health and environmental impacts of increased air pollution, costs associated with expanded pumping of groundwater, greater emissions of greenhouse gases, and other secondary effects.

Ecosystems: California's ecosystems are already seriously stressed by excessive withdrawals of water, and there have been efforts in recent years to restore basic flows. It is, however, extraordinarily difficult to identify how much ecological degradation results from specific water actions. Furthermore, society is bad at evaluating ecological destruction in economic terms or dollar values. What is the value of an extinct species? What is the value of a lost acre of habitat for migrating birds? How much ecological damage results from an incremental change in water quality or flow? These costs are certainly not zero, but the difficulties in measuring them mean they are almost always under-reported, incompletely measured, or completely ignored. And droughts increase pressure on natural systems, sometimes to the breaking point.

Agriculture: The Central Valley of California is a wonderful place to grow food and fiber if the water is available. Today, agriculture provides a relatively small percentage of California's gross state

product (GSP) -- around $40 billion out of a $2 trillion economy -- though agriculture is still important to the economy and employment and identity of the state. In some parts of the state, farming is the dominant part of the economy. During drought (and increasingly, during normal years as well), there simply is not enough water to satisfy all agricultural water demands. The three major economic impacts to agriculture expected from the drought are a decrease in food and fiber production leading to a drop in income to growers; increases in some production costs, such as the energy costs of pumping extra groundwater to make up for a drop in surface water availability; and an increase in unemployment, especially among temporary farm laborers. The total costs won't be known until after the drought ends, data are available on which areas are planted and fallowed, harvests are complete, and agricultural products are moved to markets and sold. Costs will vary substantially by region and irrigation district, depending on water availability, crop prices and demand, and more. During recent past droughts, farmers in California were buffered by high global prices for crops, overdraft of groundwater, and farm insurance, which helped boost incomes or cover losses. And the last drought coincided with a national (and to some degree global) economic recession, making it very difficult to determine the role of the drought in contributing to unemployment. This year it may be easier to discern these effects over time, but it will take time to evaluate ultimate costs.

Fires: Forest fires can cause extensive damage to human communities and natural ecosystems, and they are costly to fight. Droughts can contribute to fire frequency and intensity, but in complicated ways: sometimes droughts keep down the level of vegetation, which can reduce fire risks; sometimes droughts increase fire risks. Assessing the net costs will be possible after the drought ends, but the state is already moving to hire additional fire-fighting personnel to prepare for a bad season.

Commercial/recreational fishing: The commercial and recreational fishing sector in California is a multi-billion industry. On top of the ecosystem damages caused by drought and water policies, a long-term effect is felt by commercial and recreational fishermen when rivers and streams are closed to fishing, and when commercial stocks, especially of salmon, are damaged by poor water conditions for spawning, migration, or feeding.

Urban users: Urban water agencies are, to varying degrees, already calling for a range of voluntary and mandatory cutbacks in water use, depending on their local situation and water availability. As water use goes down, consumers will sometimes see their water bills drop. Sometimes, however, droughts lead to local increases in water rates (dollars per unit of water used) because of the need to

cover fixed infrastructure costs. (To say that this frustrates water users -- to see rates go up when they are successful at conserving water -- is an understatement. But there are ways to solve this problem with smarter rate designs.) Other increases and decreases in drought impacts that are harder to quantify include lost social value from dead lawns or gardens; changes in labor or chemical costs associated with caring for turf; stimulus to the economy from efforts to purchase more water-efficient appliances like washing machines, dishwashers, toilets, and showerheads; and other effects. Over time, investments in new water-related infrastructure for either supply or demand management may reduce future drought risks.

Industrial users: Because most of California's GSP comes from sectors that are either modest water users or in urban areas where water supplies can be purchased, total industrial income is not discernibly affected by droughts, with the exception of the secondary food processing sector, which is more closely tied to agricultural production, yield, and availability. It takes water to make beer or semiconductors or to satisfy the tourism industry, but the drought is unlikely -- at present -- to have much of any effect on this part of the economy. If the drought persists for more years, this conclusion may change either because of direct impacts on production or in the form of decisions to locate industrial assets elsewhere, in regions where water-related risks of scarcity are lower.

The total costs of drought will not be known until it ends. Even then, there will be uncertainties and unquantifiable costs. But there is no doubt that the economic risks of this or future droughts can be reduced if we can develop a more sustainable water system, and that is a worthy objective.

"The Costs of California's Bellwether Drought: What Can We Expect", Peter Geleick, 07/=2/2014, online at: http://www.huffingtonpost.com/peter-h-gleick/the-costs-of-californias_b_4747043.html?utm_hp_ref=tw

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❖ California Drought Saps Water Reserves Above and Below Ground, Says Satellite Data

Snow is scarce, reservoirs are approaching bottom, and groundwater is being exhausted in the nation's most populous state. More than a dozen communities face water shortages in the next 60 to 100 days, and there will be zero water deliveries from the state's largest canal system this year.

Trapped in a dry phase among the worst in the last 500 years, California is losing water reserves as if through a sieve, according to satellite data released Monday. The data also show that groundwater, a common safety net in times of drought, is being guzzled unsustainably in the state's prime farming region, the Central Valley.

Recognizing the perilous situation, the California Department of Water Resources cut anticipated water deliveries on January 31 from the state's largest canal system to zero for the first time in the project's 54-year history. The announcement affects thousands of farmers, as well as 24 municipal contractors. The department also requested a reduction in the amount of water that it releases through the Sacramento-San Joaquin Delta, an ecologically fragile area.

Some towns are already on the brink — last week, the California Department of Public Health announced that 17 communities, ranging in size from 39 to 11,000 people, face water shortages in the next 60 to 100 days.

From when the current drought began in November 2011 through November 2013, the amount of water stored in the Sacramento-San Joaquin watershed, the state's largest, and in the Central Valley has dropped by 20 billion cubic meters (5.3 trillion gallons), or two-thirds the volume of Lake Mead, the nation's largest reservoir.

The recent losses are in addition to the 30 billion cubic meters (7.9 trillion gallons) of water that the state lost from 2003 to 2010 – a volume equal to Lake Mead. Both figures come from analysis of GRACE data by researchers at the UC Center for Hydrologic Modeling at the University of California, Irvine. GRACE is a pair of NASA satellites, launched in 2002, that use changes in the Earth's gravity to monitor fluctuations in total water storage; that is, the amount held in reservoirs, mountain snowpack, soils, and aquifers.

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To put this in perspective, 50 billion cubic meters (13.2 trillion gallons) lost in this region between 2003 and 2013 is more than the entire state's total annual water withdrawals in 2005 — and almost half of that was lost over the last two years alone. In other words, leading up to November 2013, the diminishment in California's water reserves represent the worst two-year decline in that state in the 10-year GRACE record.

But water supply conditions in the most populous U.S. state are even more dire than these data suggest.

Thanks to an unrelenting ridge of coastal high pressure that blocked storms from the Gulf of Alaska, California's drought deepened in the two months since November 2013 — almost no rain or snow has fallen in the state during its wet season, and snowpack is just 15 percent of normal, meaning that there is little snow in the mountains to replenish depleted reservoirs during the spring melt.

From a birds-eye view, however, scientists do not know exactly how much worse the drought has become. GRACE data for December 2013 and January 2014 are not yet available for analysis due to the time required to process the raw numbers, and the next update will not be available until early summer.

Prime the Pump

Historically, California gets through two consecutive dry years by drawing down its reservoirs, according to Jay Lund, director of the Center for Watershed Science at the University of California, Davis. After two drought years, Lund told Circle of Blue, groundwater becomes an essential source.

State data bear this out. Key reservoirs that feed major canal systems are currently at or near record lows for this time of year. Near Sacramento, for instance, towns and mining roads that were inundated when Folsom Lake was created in 1955 are now above the water line, as the reservoir has recently dropped to 17 percent of capacity. Meanwhile, Stanislaus County in the Central Valley approved twice as many new wells last year as in recent years, the *Modesto Bee* reported.

Modeling done by the U.S. Geological Survey shows groundwater levels dropping sharply in drought years. Researchers at the UC Center for Hydrologic Modeling used those data to demonstrate that the aquifers in the state's agricultural heart are being used unsustainably.

Numbers from the GRACE satellites and the U.S. Geological Survey reveal a steady downward trend in the amount of water that is held in Central Valley aquifers. The aquifers are used primarily to irrigate the valley's 1.5 million hectares (3.7 million acres) of farmland, which is half of the state's total. Even though they are polluted with nitrates, the aquifers also are a water source for many small, impoverished towns.

The aquifers' decline reflects a longstanding and problematic imbalance in groundwater use — more water is pumped out during the dry years than soaks in during the wet years. In other words, the bank account is steadily being drawn down.

"The big question is really, 'What's next?'" said Jay Famiglietti, director of the UC Center for Hydrologic Modeling. "If the drought continues as expected, it will push groundwater levels to potentially disastrous lows."

Disastrous lows come with a host of repercussions. Famiglietti pointed to several:

- an increase in the cost of pumping water
- a reduction in water quality
- stream depletion
- land subsidence

A USGS study, published in November, argued that land subsidence threatens the structural safety of the Delta-Mendota canal, a major cog. Pumping from below, in other words, may cause the system to crack from above.

State Lacks Groundwater Regulation

State neglect of groundwater is not an oversight – it is inherent to the system. California has no statewide policy on groundwater use, said Doug Parker, director of the California Institute for Water Resources. No reporting requirements; no permits to regulate the amount of water withdrawn.

"Groundwater is difficult to regulate in a drought, because it's the back-up source that people rely on," Parker explained to Circle of Blue. "But sometimes drought is good, because it gets people to

consider policy changes. Groundwater is what you need to have during a drought, so we want to make sure we're not using it poorly in wet years."

Famiglietti told Circle of Blue that the state needs policies that put a brake on groundwater use.

"Unless we enact groundwater-management policies soon," he added, "our current practice of massive groundwater depletion during times of drought will threaten the sustainability of future water supplies for the entire state."

"California Drought Saps Water Reserves Above and Below Ground, Says Satellite Data", Brett Walton, 04/02/0214, online at: http://www.circleofblue.org/waternews/2014/world/california-drought-sapping-water-reserves-ground/

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❖ The 'American Nile' is in Danger of Water Shortage: Grand Canyon at Risk

The Colorado River has been flowing for six million years, carving out the Grand Canyon and providing water supply for nearly the entire Southwest. Now, environmentalists argue that agriculture, population growth, and climate change all have detrimental effects on the historic body of water.

Farming was the first issue that began dwindling the river's resources. When more settlers came to the West there was a demand for agriculture. Soon enough, irrigation ditches and canals were built and farmers began to plant wheat and hay. Cotton and citrus fruit cultivation followed, and all of these crops now consume about 70% of the Colorado River Basin's water.

But it's not just the crops that contribute to the water consumption. Irrigation of lawns and golf courses as well as water supply for swimming pools, reservoirs and thirsty cities consume the river's water. It provides 36 million Americans with water. This may not seem immediately detrimental to the water supply, but it is over time. The river basin's drainage covers a percentage of the United States that's nearly identical to the percentage of Africa drained by the Nile River.

Aside from the dwindling water supply, restoration projects are underway to help save endangered fish in the basin's waters. The pike minnow, the humpback chub, the bonytail chub and the razorback sucker have all been affected by the silt- and migration-blocking dams. The cold waters of the reservoirs are released into the rivers and affect the habitats of these fish. And although these fish have no commercial value, they contribute to the scenic and ancient history of the Colorado River, which will be eradicated if such actions continue.

Population growth is also not helping this cause. The river supplies water to the greater Las Vegas area as well as Phoenix; populations that have increased from 2,000 and 5,500 in 1920 to 2 million and 1.5 million today, repectively. Scientists have also predicted that the regions that the river supplies will get hotter and drier. The Bureau of Reclamation predicted that the Colorado River's flows will decline by 8.7% by the year 2060.

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Although it is not a well-known issue, the Colorado River shortages provide for a relatively immediate cause for concern. Some of the regions in the Southwest that rely on fresh water may not be able to receive a plentiful source from the river in the decades to come. With population growth and climate issues at the forefront of the political discourse, the Colorado River will hopefully become a more widespread cause for concern.

"The 'American Nile' is in Danger of Water Shortage: Grand Canyon at Risk", 04/02/2014, online at: http://www.scienceworldreport.com/articles/12649/20140204/american-nile-danger-water-shortage-grand-canyon-risk.htm

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