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ORSAM WATER BULLETIN

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***** Whole aims of strategic plan were not implemented, says Agriculture Ministry

ERBIL, August 18 (AKnews) – The Kurdistan Region's Ministry of Agriculture and Water Resources said the strategic plan in producing wheat, vegetables and fruits has achieved good results but has yet to achieve its aim due to an insufficient budget.

Sirwan Baban said: "Until now the process of implementing the five-year strategic plan of Kurdistan agriculture has been working in a normal way but the budget provided to the ministry is little.

"Wheat production increased from 300,000 tons to 500,000 tons and vegetable production rose from 55,000 tons to 60,000 tons in the last three years.

"Chicken meat increased from 36,000 tons to 55,000 tons and eggs from 336,000 to 430,000 tons in the same period. These are practical things to improve the agricultural sector in the region.

"In the seventh cabinet of the Kurdistan Region the aims are increasing, especially in food and water security."

In 2012 the Kurdistan Region's budget only eight percent and two percent was allocated for the ministry.

"Whole aims of strategic plan were not implemented, says Agriculture Ministry", 18/08/2012, online at: http://www.aknews.com/en/aknews/2/322373/

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***** Requests for giving trade minister honorary citizen title

ERBIL, August 18 (AKnews) – Requests have been made in Khanaqin to give an honorary citizen title to Iraqi's trade minister for his decision not to sign the trade agreement with Iran due to Iran's actions, which are drying the Alwan River.

Alwan is a river that flows from Iran to Iraq. Iran has halted the water from flowing into Iraq in hot season for four years. Now thousands of donums of agricultural land and orchards are facing drought.

Activist and committee member of the Protection of Khanaqin's Higher Interests Salam Abdullah said in a statement: "The committee asks for giving Trade Minister Kherullah Hassan the honorary citizen title.

"Iran dries up Alwan River, which causes a lack of water, makes people leave the area and has led to drought and damage to farmers' fields."

Abdullah stated: "Last year we asked not to buy goods from Iran because Iran will not stop drying Alwan River but will halt more rivers flowing into Iraq. We therefore praise the minister's conduct."

"Requests for giving trade minister honorary citizen title", 18/08/2012, online at: http://www.aknews.com/en/aknews/2/322352/

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* Iraqiya deputy praises KRG minister's stance for Alwan River flow

GARMIYAN, Aug.17 (AKnews)- Iraqi Trade Minister Kheyrulla Hassan showed an "honorable" stance by voicing his opposition to Iran's blocking of Alwand River flow, said a deputy from the Iraqiya List at Diyala Provincial Council.

Media reports said today that the Kurdish minister, who is now with a senior delegation in Iran for boosting ties, did not sign a trade deal since it did not contain any articles about the issue of blocking Alwan River.

It's more than four years that Iran has dried out Alwan and this in turn has led to dehydration of some other rivers and abandonment of tens of villages in Diyala province, said Iraqiya deputy Suhad Hayali.

Hayali said the Kurdish minister's position against blocking Alwan River is "an honorable position and we are proud of that.

"We think it's important that the ministers take such measures against the neighboring countries when the dry out our water."

Hayali continued all the possible measures have been taken to make Iran allow for the river flow once again but all attempts have failed.

"Iraqiya deputy praises KRG' minister's stance for Alwan River flow", 17/08/2012, online at: http://www.aknews.com/en/aknews/3/322292/

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KRG Agriculture Ministry signs memorandum with Northern Ireland

ERBIL, August 15 (AKnews) – The Kurdistan Region's Ministry of Agriculture and Water Resources has signed a memorandum with the Agri-Food and Biosciences Institute (AFBI) to enhance agriculture relations and to undertake research into crop, environment, food and animal production.

Media official in the ministry Majed Nourdin said: "A memorandum of understanding was signed between the Kurdistan Regional Government's Minister of Agriculture Sirwan Baban and AFBI chief executive professor Seamus Kennedy in Belfast in Northern Ireland.

"The AFBI will support the Ministry of Agriculture in undertaking science research in agriculture, animal resource, food, economy and environment for some years.

AFBI, formerly the Agricultural Research Institute of Northern Ireland, was established in 1927 with the aim of undertaking research into crop and animal production.

During his visit the minister also reached an agreement with the Irish Department for Environment, Food and Rural Affairs (DEFRA) to assist Kurdistan's Ministry of Agriculture to solve the lack of water in the region.

"KRG Agriculture Ministry signs memorandum with Northern Ireland", 15/08/2012, online at: http://www.aknews.com/en/aknews/2/321949/

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* Residents of Shangal Suffer Serious Illnesses for Lack of Potable Water

SHANGAL-- Elias has a shocking medical report that includes a long-term kidney condition.

"I have to borrow 30 million Iraqi dinars (US\$24,000) to buy a kidney and pay for surgery," Elias, 25, told *Rudaw*.

His small shop has changed from a place where he made a living to one where he tallies the money needed for pills and doctors. He crumpled in pain when reaching for a welding tool, which he uses to build doors and window frames.

Elias used to work nine hours a day in his shop but can no longer work at all due to the advanced inflammation of his kidneys.

Another kidney patient, Shirin, was in such a bad condition she was unable to speak with *Rudaw*. Ismael, her husband, said that her illness has ruined the life of the whole family. Shirin has to be taken to doctor on a weekly basis, visits paid for with the help of neighbors.

Tears welling in his eyes, Ismael said, "Her doctor told me that if I fail to bring her in, even one time, I had better prepare for her funeral."

Rudaw visited the director of the Duhok Kidney Implantation Hospital at his evening clinic. The director, who is also Shirin and Elias doctor, had a clinic full of patients suffering from kidney problems. Sixty percent of them were from Shangal.

The doctor said patients like Shirin and Elias have two options: to have kidney implants or wash their kidneys constantly for the rest of their life.

According to the doctor, the drinking water in Shangal is the main cause of this illness. The water is filled with minerals that cause kidney stones. Moreover, the excessive amount of germs and bacteria in the water cause illnesses in the stomach and abdomen.



Like many Iraqi cities, Shangal, in Mosul province, has been suffering from a lack of potable water for over half a century. Since the collapse of the Iraqi regime, the Kurdistan Regional Government (KRG) controls the district.

The people here used to take advantage of spring water in the district, but with increased demands on water and excessive use, spring waters have decreased over the years.

In Shangal, most of the compounds built by the Iraqi regime lack basic services. There is only one water filtration plant in the district which cannot provide enough water for all the residents. Most of the villages and other compounds in the area drink unfiltered water.

Moreover, only two of 11 compounds in the district have a sewage system and water distribution pipelines. Since 80 percent of Shangal's population does not have access to water, they are left with only the option of digging wells.

Each house in Shangal has a water well as well as a septic tank. The septic tanks are not more than 10 meters away from the water wells. The heavy water that infiltrates the water wells due to this setup endangers those who drink from it of becoming sick.

Underground water -- the sole source of drinking water in Shangal -- is on the verge of disappearing as well, due to drought and excessive use by district residents. In the past 10 years, the water level in some areas has lowered 50 meters.

Murad Ismael, an engineer originally from Shangal and a current resident of Texas, USA, concluded in his master's thesis that the more underground water decreases, the more dangerous it becomes. He says that if the current situation continues, in 14 years people will not be able to live in Shangal due to the disappearance of underground water and other natural resources.

Dr. Mohammed Adnan Mohammed, the director of the Yarmuk Medical Complex, says chlorine has been distributed to families to add to their drinking water, but insists "this is not a solution." Mohammed said residents have to be provided with drinking water via a pipeline.



Ibrahim Izzat, a health professional at the Khana Sor Medical Center, says that medical tests carried out over a two-week period in March showed that of every three patients, two of them had crystals in their kidneys. Out of 27 tests, 22 revealed diseases related to drinking unhealthy water.

Another problem the residents of Shangal face is a lack of medical examination laboratories. Out of 23 medical complexes, only seven have labs. These laboratories do not have advanced equipment so only basic medical examinations can be carried out. Thus, most of the illnesses are not discovered until they get to the final stage, a stage where treatment is no longer easy.

Rudaw took samples of drinking water from six different areas to the Duhok Environmental Office laboratory. Only one sample passed the test for potable water.

An E.coli test showed a large amount of bacteria in each water sample. It also showed that human and animal remains were mixed with the water.

"Residents of Shangal Suffer Serious Illnesses for Lack of Potable Water", 14/08/2012, online at: <u>http://www.rudaw.net/english/kurds/5089.html</u>

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* Iran's Blockage of Alwand River Leaves Diyala in Water Crisis

KHANAQIN— After several years of blocking and releasing the Alwand River, Iranian authorities completely dammed the river from flowing into Iraq last week.

The Alwand River originates in western Iran and flows into eastern Iraq in the Khanaqin region. 40,000 acres of land, farms depend on this river for irrigation.

Muhanad Saadi, Iraq's minister of water resources, told *Rudaw*, "Iran has not given us an explanation for this action even though we demanded one through Iraq's Ministry of Foreign Affairs."

Iran and Iraq share around 30 rivers that run through both countries. Iran has been blocking these rivers from flowing into Iraq by diverting their paths and building dams.

Tahir Mahoomd, director of Khanaqin's water department, told *Rudaw*, "In the past, during certain seasons, the river used to reach 50 feet in some areas. However, since last month the river has completely dried up."

Mahmood said that the river used to decrease about 7 feet each summer before Iraq's liberation in 2003, but recently has decreased considerably.

Regarding the farms that depend on the river, Mahmood said, "The farmers used to plant summer and winter vegetables in the fields. Lack of irrigation water forced the farmers to abandon their land in summer, and this will hurt the farmers' economic situation."

The blocking of the Alwand River has caused drought to around 60 percent of the farmland in Khanaqin.

Ali Qasim, an engineer at the Khanaqin water department, says that the drought will also affect the drinking water in the city. "We have five water stations on the river to pump drinking water to the city. Currently, none of them are working."

When the river is extremely low, he added, the water is mossy and dirty, not suitable for drinking. Qasim said that the drought will badly affect livestock as well.



Khalid Abass, director of Khanaqin Hospital, believes that the drought will cause diseases to spread in the area as people will be forced to use local wells for drinking water.

"The river cannot be used for drinking before the processes of sanitation, but some villagers are still drinking from it," Abass said.

According to the Diyala water department, the province needs 7 square meters of water per second, but by blocking the river the Iranian government is not allowing this amount to reach the area.

Mahmood said that, in order to meet the needs of the farmland and orchards in the region, the government built a canal from the Sirwan River to the area. Some of the farmers dug wells to irrigate their fields. However, Mahmood said this will not solve the problem.

"The government is currently building a dam on the river and it will be finished around November," he said. "This will solve most of the problem; it will guarantee drinking water and the extra will be used for irrigation purposes."

Officials from Iraq's Ministry of Water Resources are confident the dam will solve the problem. The dam extends 1,300 meters and has a budget of 30 billion dinars.

Salam Abdulla, member of a committee for protecting the interests of Khanaqin people, says, "We have been asking the Iraqi government to find a long-term solution for this problem, but they have failed to do so."

A couple of months ago, an Iraqi delegation went to Tehran to discuss the issue, but didn't reach an agreement.

The director of Khanaqin's water department, who was among the delegation, said the Iranians responded by saying they didn't have enough water for themselves either.

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[&]quot;Iran's Blockage of Alwand River Leaves Diyala in Water Crisis", 14/08/2012, online at: <u>http://www.rudaw.net/english/kurds/5087.html</u>



Syria crisis: Demand is high for scarce water supplies at Zaatari refugee camp in Jordan

ZAATARI REFUGEE CAMP, JORDAN—Bara'a Sala Majaresh survived months of Syrian artillery shelling in her hometown of Daraa. She dodged the crossfire between Syrian soldiers and rebels, and navigated a border to reach this refugee camp in northern Jordan.

Just when Majaresh, a 25-year-old mother of two, thought it was safe to breathe a sigh of relief, she faces a new crisis: she's about to be told to cut back on her water use.

Administrators of the Zaatari camp say that as the number of refugees here continues to climb in coming weeks, it will be increasingly difficult to keep pace with the demand for water.

The camp, which opened July 29, is currently using 51.2 litres per person per day for drinking, cooking and cleaning, said Stephan Mack, a program manager with Germany's federal agency for technical relief. By contrast, the average Jordanian uses about 40 litres.

On one hand, it's little wonder the refugees are using so much water. The blazing afternoon sun doesn't so much heat the camp as fry it to a crisp. While every few minutes, mini-cyclones wash across the landscape, covering everything with a layer of sand and grit.

Some days, the drinking water that is stored in huge plastic bladders and surrounded by sandbags approaches the boiling point. Several refugees said they had been scalded when they drank from the taps.

"This is hell," Majaresh said, wiping dirt from the face of her 18-month-old toddler. "It's not living. You look around, how am I supposed to stop using so much water? It's crazy."

The goal is to reduce water use to between 35 to 40 litres per person per day, said Saeed Hameed, a water specialist with UNICEF, the United Nations Children's Fund.

One aid official said water taps may be refitted with spouts that limit water to a trickle. UNICEF also plans an education program about water conservation and hygiene for the refugees.



"We've had a problem with people defecating in the showers and we have to explain why this is a problem," Hameed said. "It attracts flies that can carry disease."

The need to conserve water is not as critical in Syria as in Jordan, which is one of the world's driest countries and struggles with a water crisis.

Desert covers 92 per cent of Jordan and its main surface water source, the River Jordan, has lost 95 per cent of its natural flow because of canals and irrigation up river in countries like Syria and Israel.

As Jordan's water needs are growing — its population of 6.7 million is climbing 3.5 per cent a year — its resources are dwindling. In the capital city of Amman, the government provides tap water to many homes just once a week.

For the past several years, the government has been building the Disi Water Conveyance project, a \$1.1-billion effort to tap into an ancient 300,000-year-old aquifer, although the project is delayed after a 2009 study by Duke University professors found the water highly radioactive. The government disputes the study's findings.

In one respect, Zaatari is unique among refugee camps.

It's as dry and hot as any camp in sub-Saharan Africa, but in addition to working-class, uneducated farmers and daily labourers, there are many middle and upper-middle class Syrians, who walk through Zaatari wearing \$100 soccer jerseys and Ralph Lauren golf shirts.

"We are living like nomads in the Sahara," said one man, who didn't want to give his name in order to protect family still in Syria.

"I just can't believe it," said the man, 51, who was educated in the U.K. "For years I watched TV and saw these ads from charities that were fundraising for camps like this. Now I'm in one."

After two weeks, there are 15 water distribution points with six taps apiece, 87 chemical toilets, and 25 Turkish-style flush toilets. The hard plastic bladders at every water point can hold 10 tons of water.



"We've put the black shades over them to try to keep the temperature down," Mack said.

Camp officials, in anticipation of a long stay, are building more permanent water facilities — 40 cinder-block buildings that each have five toilets, and an adjoining septic system, and five showers.

"We're going to have dry, hot, dusty conditions for months," Mack said. "The consumption's going to increase."

Currently, six trucks with the capacity to hold between 8,000 and 40,000 litres bring 258,000 litres of water a day to Zaatari from nearby cities, Mack said.

Drilling should begin soon to allow officials to build a well that will tap a non-renewable aquifer 500 metres underground.

"It's like a race," said Mack, 49, who has also established water facilities at refugee camps in Haiti. "Refugees come in, we have to try to keep ahead of the demand."

"What would I tell someone who comes tonight?" asked Majaresh, the mother of two from Daraa. "I'd say welcome to hell. I don't remember what cold water tastes like."

"Syria crisis: Demand is high for scarce water supplies at Zaatari refugee camp in Jordan", 13/08/2012, online at: <u>http://www.thestar.com/news/world/article/1241157--syria-crisis-demand-is-high-for-scarce-water-supplies-at-zaatari-refugee-camp-in-jordan</u>

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Size Israeli Innovation: Helping to Solve Global Water Issues

In a world where freshwater resources are becoming increasingly limited, Israel – a country that is two-thirds arid – has become a leader in developing the necessary technology for making salt water drinkable.

The Israeli desalination company, IDE Technologies, which has been in operation for more than 40 years, has made many advances in desalination technology, installing over 400 desalination plants in 40 countries, including the Caribbean Islands and United States. In recent years, IDE won major contracts with Cyprus, India, Australia, and China.

Since 2011, the Israeli-built desalination plant in Tianjin is China's largest and most environmentally friendly desalination plant to date, running on some of the waste heat produced by a nearby power plant, producing both fresh water and salt.

However, these plants for the most part are extremely costly for less-developed nations, as they use enormous amounts of electricity and are location-sensitive. But thanks to a recent Israeli discovery, the desalination system may become much more affordable in areas like Africa and the Middle East.

Researchers from the Zuckerberg Institute for Water Research at Ben Gurion University of the Negev and central Arava R&D, have found a way to utilize solar energy at a fraction of the cost which can be custom-engineered for the desalination process, according to the Israel Ministry of Foreign Affairs (MFA).

The new innovation uses solar energy panels to power the pumps of a desalination unit that generates clean water for crops. More importantly, the technology utilizes unique nanofiltration membranes that enable farmers to decide which minerals should be retained from the water to feed various types of crops, a method which requires much less energy. The new system is currently being tested in the Arava Valley of Israel, south of the Dead Sea, where the basin is very dry. The results thus far show that farmers can use up to 25 percent less water and fertilizer than what has usually been needed in that area



According to Andrea Ghermandi of the Zuckerberg Institute for Water Research at Ben-Gurion University, and one of the system's creators, the current environment is forcing agricultural systems to become more economical. Ghermandi told the MFA that "the growing global demand for food and competition for resources among economic sectors compel future agricultural systems to be more efficient in the use of natural resources such as land and water."

Another important researcher in the discovery, Ben Gurion University's Rami Messalem explained that the "breakthrough here was to make the system more economical and we've done this using nanofiltration cleverly. Our system is compatible with electricity but is based on the premise that it can be used in poor countries, in places where you don't have an electricity source—as a standalone system."

The new desalination system was made possible thanks to funding from Swiss philanthropist Samuel Josefowitz.

"Israeli Innovation: Helping to Solve Global Water Issues", 13/08/2012, online at: http://www.algemeiner.com/2012/08/13/israeli-innovation-helping-to-solve-global-water-issues/

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* Israeli Occupation Causes Chronic Water Shortage in the West Bank

Two third of the earth's surface consist of water. 2.5% of that is drinking water, of which just one third is amenable to us.

In the European Union for example there are 8,500 liters per day available for each citizen. That makes 2.3 million liters per year. Divergent climatic circumstances, the climate change, varying levels of runoffs and an unequal distribution of water resources are reasons for more frequently cases of water shortage in some parts of Europe.

This is also problem that confronts many areas in the Middle East.

However, the problems facing the Palestinians in the West Bank go way beyond this.

The annual renewable amount of groundwater in the West Bank is 669 million cubic meters. In addition to that there is around 215 million cubic meters (MCM) of runoff water available. In the interim convention about the West Bank and the Gaza Strip from 1995, an annual water abstraction of 118 MCM for the West Bank was fixed, while 94 MCM are alone used for industry and agriculture. Furthermore there are 54 MCM more purchased by the Israeli National Water Company called Mekorot. The bottom line is that there are 148 MCM of water available to the people living in the West Bank. That means just around 22% of the entire water sources in the West Bank at a distribution of 65 liters per capita per day. The World Health Organization (WHO) recommends 100 liters per person per day. So there is a serious deficit.

In contrast an Israeli settler's allocation is nearly 300 liters per day. But this water is mainly taken from Palestinian resources as Mekorot does. Mekorot extracts groundwater from the West Bank to sell to the Palestinians when they are running out of the water provided by the government.

One possible way to compensate for the lack of water is to build wells or rain water cisterns, which are subject to the strict regulations of the Israeli government. Such regulations maintain that the wells mustn't reach deeper than 150 meters while Israeli settlers are allowed to dig wells reaching a depth of 600 meters. Since the groundwater level runs low continuously due to Israel's high water consumption, wells with a depth of 150 meters will not serve their purpose for very long and deeper



digging is needed. Since deeper digging is forbidden this seriously hampers the effectiveness of wells as sources of water.

This is all assuming that Palestinians are granted permission to dig a well in the first place. Permits for digging wells in Areas A and B are difficult to get and in Zone C they are impossible to get because building anything in those areas is forbidden being under Israeli military control.

A farm called *"Tent of Nations"*, which was built in 1916, is located in Zone C. Today it is surrounded by five Israeli settlements and the owners are deeply troubled by the demolition orders placed on their cisterns. They have fought against these cases in court and are required to fight continuously merely for the existence of their farm to remain.

In light of this they are forced to deal with the water shortage in inventive ways, since their only water resource is rainwater that falls only during the winter months, which they save in the cisterns.

Asked how they ensure that the limited water they have access to during the year one lasts throughout one of the volunteer workers said that they have to "Save water, catch water, recycle water."

The owner Daud went further, "There are some easy ways like covering a freshly watered spot with dry earth to avoid evaporation. Furthermore we mostly plant trees that don't need a huge amount of water like almond trees, for example. Everything that needs more water is planted around the showers. We also built a compost toilet and at the moment I'm working on a natural waste water sewage plant, in which the sewage water is filtered through sand and stones, so you can use it for irrigation."

Wastewater usage is a further problem influencing the water supply in whole the West Bank. According to the *Palestinian Water Authority (PWA)* only 31% of all households in the West Bank are connected with the sewage water system. There are just four water treatment plants and one modern sewage treatment plant. Needless to say this lack of infrastructure creates serious problems.

The remaining wastewater is either led into the Wadis or into the sea of Gaza. According to the NGO *Friends of Earth Middle East (foeme)* the untreated wastewater from the Israeli settlements is allowed to flow directly onto the surrounding natural environment or into the Jordan River.



Since Israel extracts its water from the upper Jordan basin there is very little water available for Palestinians and due to Israeli wastewater practices almost none of it is clean.

Compounding this problem the sewage waste seeping into the environment further contaminates the ground water.

The case of Bethlehem is instructive. The city of Bethlehem is mainly supplied by groundwater, unless residents have additional rainwater cisterns. Bethlehem shows, that in addition to the problems caused by the occupation and the climate with low precipitation, there are also technical difficulties in the West Bank in ensuring adequate water distribution.

The system works as follows:

The *Bethlehem Water Authority (BWA)* gets their order about the maximum amount of water that can be extracted from a certain source, from the *PWA*. The water level of that source is measured and if it is at a certain level the *BWA* is allowed to open the pipeline of this source. The water runs to the households where it is saved in water tanks. In Bethlehem this happens roughly every 10 to 15 days.

The problem here is that Bethlehem and its suburbs are divided into four areas, which are all each supplied by separate sources. Since the water sources have different capacities and the pipelines of the four areas respectively are not connected with each other not every area gets the same amount of water or received water in the same time period.

At *al-Aida* refugee camp in Bethlehem the access to water is even more difficult. There most of the houses have an extra house pump to compensate for the either inadequate existing infrastructure or the complete lack of infrastructure at all.

That means when the water line to the camp is opened, the people have to switch on their house own pumps so that the water can reach their tanks.

According to an inhabitant of the camp the line is usually opened at night, but nobody tells the people the date on which it will be opened. So, when the people expect the water to come they have to stay



awake and listen at their water line. If they hear water running in it they must rush to turn on their pumps in order not to miss the window of opportunity when the line of water is running.

Failure to do this means they miss out.

The location of the camp and the quality of the old water system combine to cause further problems for inhabitants of the *Aida* camp. The camp is located on a hillside and the pumps for the lines are too weak to transport the water to the buildings furthest up the hills. The people living in those houses have to get their water from a collection tank at the entrance of the camp and carry it home in canisters.

The *BWA* and the *PWA* have said that besides the water shortage and the problems caused by the occupation there are also internal difficulties inhibiting the distribution of water, chief among them are how to design and fund a new system that replaces the old one.

The lack of local investor capital and the general instability in both the public and private sector in Palestine means that any infrastructural projects most likely will have to be funded by foreign capital. This would mean necessarily taking on more debt and as it is the Palestinian economy is struggling to stay afloat.

The occupation and the conditions that come with it mean that there is one burning issue that is never addressed. Both the *PWA* and the *BWA* have said that there can be no sustainability under occupation. Farming is not sustainable long term because of the inefficient, increasingly stressed and diminishing water supply, as well as the ongoing dispassion of land.

Given that the immediate conditions of the occupation demand political action there is no time or space for many to think about environmental sustainability.

The water shortage in Palestine poses serious challenges for daily life and it will continue to get worse. In Gaza agriculture is barely possible under hard circumstances due to the shrinking ground water level and contaminated water from the sea.



WATER RESEARCH PROGRAMME -Weekly Bulletin-

This is in fact in line with Israeli policy aims. Wikileaks exposed cables from Israeli diplomats in which it was exposed that the intention of the blockade on Gaza was to keep the Palestinian economy on the verge of collapse without quite pushing it over the edge. It is the restrictions on movement, the bombing of infrastructure and the blockade, which have created an environment that is not sustainable in the long term.

The river Jordan is great diminished also and the water level of the Dead Sea shrinks rapidly. The situation today should be cause for grave concern amidst those in the International community and for Israel to consider its water policy for reasons of long-term self-survival and of fair treatment of the Palestinians.

"Israeli Occupation Causes Chronic Water Shortage in the West Bank", 14/08/2012, online at: http://english.pnn.ps/index.php/politics/2449-israeli-occupation-causes-chronic-water-shortage-in-the-west-bank

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* Israeli Occupation Razes Agricultural Lands, Demolishes Water Well in Al-Khader

On Monday 13th August, Israeli bulldozers razed agricultural lands and demolished water well used to irrigate crops in al-Khader village, south ofBethlehem.

Coordinator of the Popular Committee Against the Wall and Settlements, Ahmad Salah, said that the razing process included five acres belonged to Riziq Mohammad Salah in al-Abasiyeh area, adjacent to *Eliezer* settlement.

The Israeli soldiers took the olive trees that were uprooted in the lands, and demolished the well built to collect rain water.

Salah said that the Israeli settlement policy against the agricultural lands of al-Khader village aims to confiscate the Palestinians' lands and construct public parks and gardens for Israelis, as it was revealed in the last settlement plan.

"Israeli Occupation Razes Agricultural Lands, Demolishes Water Well in Al-Khader", 13/08/2012, online at: <u>http://english.pnn.ps/index.php/national/2443-israeli-occupation-razes-agricultural-lands-demolishes-water-well-in-al-khader</u>

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In a world where freshwater resources are becoming increasingly scarce, Israel–a country that is twothirds arid–has become a leader in developing the necessary technology for making salt water potable.

The Israeli desalination company, IDE Technologies, which has been in operation for more than 40 years, has made many advances in desalination technology, installing over 400 desalination plants in 40 countries including the Caribbean Islands and United States. IDE Technologies has also won major contracts with Cyprus, India and Australia, and last year with China.

Since 2011, the Israeli-built desalination plant in Tianjin is China's largest and most environmentally friendly desalination plant to date, running on some of the waste heat produced by a nearby power plant, producing fresh water and salt.

However, desalination plants for the most part are extremely costly for less-developed nations, as they use enormous amounts of electricity and are location-sensitive. But thanks to a recent Israeli discovery, the desalination system may become much more affordable in areas like Africa and the Middle East.

Researchers from the Zuckerberg Institute for Water Research at Ben Gurion University of the Negev and central Arava R&D, have found a way to utilize solar energy at a fraction of the cost which can be custom-engineered for the desalination process, according to the Israel Ministry of Foreign Affairs (MFA).

The new innovation uses solar energy panels to power the pumps of a desalination unit that generates clean water for crops. More importantly, the technology utilizes unique nanofiltration membranes that enable farmers to decide which minerals should be retained from the water to feed various types of crops, a method which requires much less energy. The new system is currently being tested in the Arava Valley of Israel, south of the Dead Sea, where the basin is very dry. The results thus far show that farmers can use up to 25 percent less water and fertilizer than what has usually been needed in that area.



According to Andrea Ghermandi of the Zuckerberg Institute for Water Research at Ben-Gurion University and one of the system's creators, the current environment is forcing agricultural systems to become more economical. Ghermandi told the MFA that "the growing global demand for food and competition for resources among economic sectors compel future agricultural systems to be more efficient in the use of natural resources such as land and water."

Another important researcher in the discovery, Ben Gurion University's Rami Messalem explained that the" breakthrough here was to make the system more economical and we've done this using nanofiltration cleverly. Our system is compatible with electricity but is based on the premise that it can be used in poor countries, in places where you don't have an electricity source—as a standalone system."

The MFA website indicated that the new desalination system was made possible thanks to funding from Swiss philanthropist Samuel Josefowitz.

"Israeli Innovation Could Make Water Drinkable in Africa", 13/08/2012, online at: http://www.jewishpress.com/news/israel/israeli-innovation-could-make-water-drinkable-in-africa/2012/08/13/

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***** Desalination and the Israel-Palestine issue

Desalination can have significant repercussions on the environment, and much of those are not fully understood yet.

Regional water politics has once again featured Israel, this time with South Sudan, where Israel Military Industries Ltd., on behalf of the Israeli government, signed an <u>agreement</u> with the South Sudanese government to provide the latter with water infrastructure and technology development. The two countries agreed to co-operate on areas of desalination, irrigation, water transport and purification.

It would appear that one of the strategic advantages for Israel in pursuing such a deal, aside from a potential oil deal, is to be able to play a part in the hydro-politics of the Nile, creating a potential point of leverage over Egypt. Israel clearly has much to offer within the water infrastructure and technology sectors. And it leads one to ask questions about how the strides Israel has taken domestically in areas such as desalination will impact the Israel-Palestine water issue.

In my previous Al Jazeera <u>op-ed</u>, I argued that the realities on the ground concerning the water issue necessitated a one-state solution, if there is to be a just and equitable resolution to the situation. Yet some posed the suggestion that Israel's highly ambitious desalination <u>master plan</u>, largely enabled by the discovery and exploitation of substantial gas <u>reserves</u> off the coast of Israel can potentially remove the water issue from the list of major stumbling blocks to attaining equitable terms for peace within a two-state framework.

Aggressive desalination project

Israel has indeed been pursuing an aggressive desalination <u>project</u>. With the aim of providing around 600 million cubic metres/ year (MCM/yr) through desalinated seawater by 2015, Israel has constructed three major desalination plants, with a fourth and fifth slated for completion in 2013. The <u>Hadera</u> plant, completed in 2010, has a present capacity of around 130 MCM/yr, making it the largest reverse osmosis plant in the world. The <u>Sodek</u> plant that is to be completed next year will surpass Hadera with a capacity of 150 MCM/yr.



In all, desalination should provide 22.5 per cent of all potable water demand by 2015. And in the <u>long</u> term, between the years 2040 and 2050, Israel has plans to invest around \$15bn to reach a capacity of 1.75 billion cubic meters/ year and provide 41 per cent of Israel's potable water demand. Such ambitious targets are not unrealistic for Israel. They have been pioneers in the water sector for decades. Attributable to them is drip irrigation technology, a method for irrigating crops that uses dramatically less water than the traditional flood irrigation method.

Israel also treats the vast majority of their wastewater and effluent, using 80 per cent of it for agriculture, by far the highest in the world. And in desalination, the Israelis have largely pioneered reverse osmosis technology, a method that is environmentally cleaner and less fuel intensive than the traditional multi-stage flash method. With recent discoveries of offshore natural gas fields, the prospect of running these desalination plants become both more feasible and more secure.

But even with Israel meeting these ambitious targets, the notion that this will allow for any change vis-a-vis the Palestinians and the ongoing exploitation of their water resources is highly unlikely. There are several reasons this is the case:

For one, desalination is simply too expensive and even in the long term the most it can do is <u>cover</u> Israel's growing demand, rather than eat away at the share of natural resources that Israelis consume. Israel uses about 40 MCM/yr more than the natural replenishment rate of the ground and surface water they exploit, and it is assumed this will continue into 2020 despite the construction of more desalination plants, as population and economic growth will offset the increase in capacity.

In the short and medium term, desalination can only supplement existing sources and allow for Israel to meet demand in times of drought, which are becoming more frequent with climate change. Anything in excess will likely be used to rehabilitate existing aquifers and lakes, rather than replace them as a source. Many <u>experts</u> have already pointed out that far more effective, immediate and economically feasible results can be attained by tackling consumer demand, improving wastewater use and improving infrastructure such as leaking.

Repercussions on the environment



There are also environmental considerations that need to be taken into account by the Israelis. Desalination can have significant repercussions on the environment, and much of those repercussions are not fully understood yet. What is known is that desalination plants, even those that use reverse osmosis, emit high levels of air pollution and greenhouse gases, can potentially damage marine life with the discharge of brine and residual salt back into the sea and can damage valuable coastal land areas.

As environmental awareness grows and the ramifications of marine and air pollution are better understood, we can expect some sort of backlash from the population that may limit the extent to which the Israelis will turn to desalination.

Furthermore, greater reliance on desalination presents security risks that Israel is unlikely to overlook. Relying heavily on such massive structures that are vulnerable to attack decreases the likelihood they will be allowed to become the main or only source of freshwater.

And lastly, greater desalination capacity will not cause the Israelis to alter the status quo vis-a-vis the Palestinians for one key reason; Israel does not have to. The leverage that the Palestinians and their advocates in the region and around the world have over Israel's water policy is unfortunately minimal. And even the soft power that is exerted by NGOs, activists, and even governments rarely translate into any shift in policy by the Israelis.

Like most states, Israel subjects itself to the tenets of power politics, and one can assume Israel would not voluntarily give up the hegemonic position it enjoys over its neighbours' resources, even if it did begin utilising alternate sources. The growing uncertainties in Syria and Lebanon make this even more unlikely, as both countries are riparians to Israel. Ironically in fact, Israel may find its negotiating position weakened on the water issue the more its desalination capacity grows and the reasons for restricting Palestinians' access to water becomes more blatant and less justified.

This logic can possibly explain why Israel has ardently supported plans for a desalination plant in <u>Gaza</u>. Not only would this undercut Palestinian claims to their aquifers, it would also make Gazans even more vulnerable to Israel, as the Israelis have a notorious history of deliberately <u>targeting</u> civilian infrastructure in the area.



And so considering all these factors, I see no reason to assume that in the coming decades gas and desalination will play a role significant enough to reduce Israeli dependence on water originating in Palestine, and the issue will continue to be one of the many barriers to achieving a just two-state solution.

Ramzi El Houry is a PhD candidate at Freie University in Berlin. He is currently based in Kuwait as an Adjunct Professor and Programme Coordinator for the Centre for Gulf Studies at the American University of Kuwait.

"Desalination and the Israel-Palestine issue", 15/08/2012, online at: http://www.aljazeera.com/indepth/opinion/2012/08/201281373146974754.html

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* Report: Gazans spend 30% of income on fresh water

UK's Oxfam, PA's EWASH warn shortage of clear drinking water poses growing health risk for Strip's residences. Israel says it's doing everything it can to ease plight; says Gazans reluctant to accept offer

A new report by the British human rights organization Oxfam determined that the <u>fresh water</u> supply in Gaza Strip fails to keep up with the growing populations.

The report found that the Strip's residents pay up to one-third of their household income on <u>drinking</u> <u>water</u> and the growing shortage of fresh water sources is posing a growing health risk.

Oxfam said that much of the water network was damaged during <u>Operation Cast Lead</u>. The 2009 military campaign saw <u>Israel</u> fight Gaza-based <u>terror groups</u>.

Gaza's government has so far repaired only part of the damage and according to the report, the damaged infrastructure has been deteriorating further.

According to Green Prophet, Gaza's main source of water is the Coastal Aquifer.

Ghada Snunu of EWASH, a non-governmental organization that deals with water quality, told the online magazine that "95% percent of the water in the Coastal Aquifer has dangerous levels of nitrates and chloride, often ten times what the World Health Organization recommends."

Both organizations attribute the plight to Israel's blockade of Gaza, imposed in a bid to limit the smuggling of weapons and explosive into the Strip, for the situation.

Israeli government spokesman Mark Regev stressed that Israel is doing everything within its power to help facilitate Gaza's fresh water needs: "Israel has been helping to improve the water infrastructure in Gaza and Israel was willing to double or even triple the amount of water going into Gaza.

"It is the same water that you and I drink, and the Gazans would pay less than what we pay but they weren't willing to accept that solution."

Palestinian water officials in Gaza say that Israel provides just 4-5 million cubic meters of water to Gaza a year, while the Strip uses 100 M3 for drinking alone.

The report also quoted Monther Shublaq, director of Gaza's Coastal Municipal Water Utilities as saying that the majority of Gazans rely on private water deliveries; but those are unregulated and may be contaminated.



WATER RESEARCH PROGRAMME -Weekly Bulletin-

As Gaza has an ocean, one solution is desalination. Oxfam and CMWU have recently inaugurated a desalination plant and water distribution pipeline in the southern city of Rafah.

"Report: Gazans spend 30% of income on fresh water", 16/08/2012, online at: http://www.ynetnews.com/articles/0,7340,L-4267655,00.html

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✤ Israel Continues to Lead in Water Innovation

With approximately 60 percent of the already small country taken up by desert, it is unsurprising that Israel has become a center for water innovation. Earlier this summer, <u>the World Food Prize</u> <u>Foundation awarded</u> Israeli agriculturist Dr. Daniel Hillel for his groundbreaking work in microirrigation. The award-winning Israeli desalination company, IDE Technologies, has added other major advances in water technology to the Israeli mantle. The company's desalination plant in Tianjin, China is the largest and most environmentally friendly desalination plant in the country, powered by waste heat emitted from a nearby power plant and producing both fresh water and salt. While these plants can be major boons to the countries that host them – including Cyprus, India and Australia – they can often be too costly to erect in less developed countries.

But a new discovery may make these desalination systems affordable for water poor areas including Africa and other parts of the Middle East. Researchers from the Zuckerberg Institute for Water Research at Ben Gurion University in the Negev (Israel's vast desert region) and central Arava R&D are now able to use solar energy to run a custom-engineered desalination process at a fraction of the cost of more conventional systems. Not only does the new technology generate clean water for crops, it also allows farmers to choose which of the salt water's minerals should be retained. Tests in Israel's Arava Valley, just south of the Dead Sea, are showing that farmers will need up to 25 percent less water and fertilizer than they had typically used.

Ben Gurion University's <u>Rami Messalem</u> said the "breakthrough here was to make the system more economical and we've done this using nanofiltration cleverly. Our system is compatible with electricity but is based on the premise that it can be used in poor countries, in places where you don't have an electricity source — as a standalone system."

"Israel Continues to Lead in Water Innovation", 14/08/2012, online at: <u>http://revmodo.com/2012/08/14/israel-continues-to-lead-in-water-innovation/</u>

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Could Phones Revolutionize Palestinian Agriculture?

World food prices soared over 6 percent in July <u>according to</u> the United Nations' Food and Agriculture Organization. Prices are continuing to rise, and food security is already a constant threat in the West Bank and Gaza.

The Applied Research Institute in Jerusalem <u>estimates</u> that over half the households in Gaza are food insecure, and almost 80 percent of households in Gaza are reliant on relief support. The institute estimates there are up to 550,176 food insecure persons in the West Bank, 22 percent of the population, and 829,954 in the Gaza Strip, around 52 percent. In the West Bank, those living along the border and separation barrier experience higher levels of food insecurity. These dire circumstances need innovative, domestic solutions.

The conflict with Israel isolates Palestinians in countless ways, impeding movement, trade, and access to water. It further complicates the rising risk of food insecurity. But mobile technologies provide Palestinians greater access to employment and information. Today an estimated <u>90.6</u> percent of Palestinians use mobile phones. Businessman Murad Tahboub told <u>The Guardian</u> that the IT industry is resilient to political turmoil.

"Checkpoints and borders don't matter," he said. "As long as you have access to electricity and a phone line, the basics of your business are in place."

Foreign investors are increasingly interested in developing Palestinian technology, <u>natural resources</u> and <u>solar power</u>. The IT industry in particular has seen a 64 percent increase in foreign business since 2009. And it is still growing. Such mobile technology and networks are intrinsically tied to food security in the Middle East.

A recent <u>report</u> by the World Bank found that mobile and digital technologies have immensely positive impacts on a developing community's agricultural industry. Mobile phone technology was linked to increased entrepreneurship and proactive strategizing among Moroccan farmers. Another study cited in the World Bank report found that introducing mobile phones could reduce grain price dispersion by 6.4 percent and reduce price variation by 12 percent in just one year.



Palestinian <u>companies</u> and institutions are investing heavily in education, hoping to arm their texthappy youth with the knowledge needed to confront challenges like environmental degradation and food security. The Palestinian Authority and Ramallah City Hall are currently working together on an <u>environmental education initiative</u> that hopes to reach 4,000 students in 14 schools across the city.

"Our difficult circumstances over the past 100 years mean that education is now our only asset," said Tahboub. "It was the one thing we could carry with us."

"Could Phones Revolutionize Palestinian Agriculture?", 15/08/2012, online at: http://www.greenprophet.com/2012/08/palestine-phone-agriculture/

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Humanitarian Groups Warn of Clean Water Crisis in Gaza

LONDON, United Kingdom — UK-based humanitarian organization Oxfam said last week that the media focus on political issues in the Gaza Strip is masking serious humanitarian issues, particularly access to clean water for the area's 1.6 million people.

A report recently released by the United Nations Office for the Coordination of Human Affairs (OCHA) claims that some Gazans spend up to one-third of their household income on drinking water.

And Emergency Water Sanitation and Hygiene, an NGO that deals with water quality, estimates that 95 percent of Gaza's water has dangerous levels of pollution.

Gaza draws most of its water from a coastal aquifer, through a series of wells. The aquifer is being over-pumped, with annual quantities that double the safe pumping rate of 50-60 million cubic meters per year, according the Palestinian Water Authority.

Over-pumping of the aquifer causes seawater and surrounding saline aquifers to intrude into the freshwater source, leading to dangerous levels of chlorides, nitrates and other pollutants, some almost 10 times the World Health Organization (WHO) values.

The greatest risk, according to Oxfam, is to Gaza's children, who make up half of the population. According to the group's new report: "Microbiological water contamination, mainly from sewage seeping into the aquifer, is pervasive and responsible for high incidents of diarrhea and other waterassociated diseases, in Gaza's children under five in particular."

In certain parts of the Gaza Strip, more than half of the drawn water is lost due to poor and deteriorating infrastructure. Repairs are difficult to make because Israel's blockade of Gaza limits imports of some raw materials that could potentially be used to make weapons.

The Gaza Strip currently purchases about 5 million cubic meters per year from Israel's national water company, Mekorot.Israel has indicated that it is willing to sell more water to Gaza, according to a report by The Media Line.



Gaza's new desalination plant, opened this week in Rafah, will help to alleviate the situation. It is anticipated that it will eventually be extended to produce a total of 100 million cubic meters of fresh, clean water a year.

The project cost \$550,000 USD, and was funded by the European Commission's Humanitarian Officeand Oxfam, in partnership with the Coastal Municipal Water Utility.

However, the costs of operating a large-scale desalination project are prohibitive, and there are concerns that this will affect Gaza's coastal environment.

"Humanitarian Groups Warn of Clean Water Crisis in Gaza", 14/05/2012, online at: <u>http://www.ooskanews.com/daily-water-briefing/humanitarian-groups-warn-clean-water-crisis-gaza_23850</u>

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* Agriculture and Water Connect Israel to Africa

Israel's Deputy Foreign Minister, Danny Ayalon, landed on Monday in Addis Ababa, Ethiopia. He continued on to Uganda and Kenya, where he will inaugurate two Israeli-cooperation projects in agriculture and health. According to Gil Haskel, Israel's ambassador to Uganda, the Jewish state is interested in strengthening agricultural cooperation and collaboration with Uganda.

Agriculture and water are becoming the foundation for a new era of Israeli relations with African states. In July, South Sudan made its first official <u>agreement</u> with Israel, a pact to cooperate on water infrastructure and technology development. Some of these programs involve the Nile. Neighboring Arab nations are concerned but preoccupied. In his recent Al Jazeera <u>editorial</u>, Ramzi El Houry alluded that Israel's new involvement with the <u>hydro-politics</u> of the Nile might give the Jewish state leverage over Egypt.

Director of the African Division at the Israeli Foreign Ministry, Avi Granot, recently told <u>Ynet</u> that many African leaders visited Israel this year, seeking to revive the 'golden era' of close relations with Israel.

"This last year they expressed disappointment at the promises made by Arab nations in the '70s and '80s, when African countries were pressured to cut off diplomatic ties with Israel in exchange for development aid," he said.

Granot believes that recent revolutions in the Middle East have made Africa more open to Israel. There are also an increasing number of Israeli businesses <u>investing</u> in African agriculture.

Israel recently launched a mission to Ghana and is considering reopening its embassy in RDC Congo. Israeli Prime Minister Netanyahu's trip to Africa, cancelled three months ago, has now been rescheduled for the coming summer.

"Agriculture and Water Connect Israel to Africa", 15/08/2012, onlineat: http://www.greenprophet.com/2012/08/agriculture-water-israel-africa/

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* Israel, China Presence in Nile Basin Rejected by New Egypt Water Minister

CAIRO, Egypt — Egypt's new minister of irrigation and water resources, Mohamed Bahaeddine, said last week that an Israeli presence was unwelcome in Nile Basin countries.

"We totally reject any sort of Israeli presence in any Nile Basin country," Bahaeddine told a press conference.

He was responding to the water cooperation agreement signed last month between Israel and the new nation of South Sudan.

Bahaeddine outlined Egypt's strategy towards fellow Nile Basin countries: "Egypt will not waive its historical rights to Nile water. International law protects Egypt's [annual] share of Nile water."

However, Bahaaeddine left the door open for diplomatic efforts.

"We will not stop negotiating with Nile Basin countries," he said.

Egypt will continue to invest in irrigation and other water projects throughout the Nile Basin.

"Our relationship with South Sudan is all-important," he added. "Around 500 billion cubic meters of rainwater drop on that country every year, and Egypt receives only half a billion cubic meters."

He said Egypt would cooperate with both Sudan and South Sudan to make the best use of water resources that are currently being wasted in those two countries.

Egypt has been attempting to continue work on the Jonglei Canal project in South Sudan, which is expected to provide an additional 4.7 billion cubic meters annually to be distributed among the three countries.

The canal is supposed to be 360 kilometers long, and only 260 kilometers have been dug. Seventy percent of the digging work had been completed before the project was halted in November 1983, and the project was totally stopped in February 1984.

The new minister added that Egypt knew little so far about the Ethiopian Renaissance Dam project.



"The dam is still in its preliminary phase, and Ethiopia has not yet conducted detailed studies on the project. Therefore, we do not have enough information about it," he added.

Bahaeddine expressed concern about the fact that Ethiopia was seeking funding for the project from China.

"International financing organizations will not fund the project without Egypt and Sudan's consent. But I'm afraid China might offer funds for this project," he said.

Egypt is facing difficulties in securing water resources, he said.

"Egypt now needs 62 billion cubic meters of water annually, while we currently have only 55.5 billion cubic meters [through the River Nile]."

He said the country planned to reuse 6 billion cubic meters of agricultural wastewater to fill the gap, he said.

"Israel, China Presence in Nile Basin Rejected by New Egypt Water Minister", 13/08/2012, online at: <u>http://www.ooskanews.com/daily-water-briefing/israel-china-presence-nile-basin-rejected-new-egypt-water-minister_23830</u>

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***** Rift on the Nile: Challenges lie ahead for Nile water sharing

"Egypt, the gift of the Nile" is a phrase coined by the Greek historian Herodotus 3,000 years ago in his book about Egypt. His description continues to be true today, as Egypt is the only place in the world where a river cuts across a thousand miles of desert, creating a civilization along with it.

The Nile is the lifeline of Egypt, with people crowded on its sides, cities located along its banks, and roads shaped along its bends. But what Egyptians have long taken for granted, the abundant Nile always flowing through their lands, may be facing a dramatic shift.

Although the post-revolutionary atmosphere gave rise to many gestures of goodwill that have eased differences over the distribution of Nile water, Egypt is still facing serious pressure from irritated Nile Basin countries to agree on a new water-sharing package.

The Cooperative Framework Agreement that was signed in 2010, which reduces Egypt's quota of the Nile water, has become even more pressing since Burundi joined five other Nile Basin states in the agreement last year, giving it the necessary majority to begin implementation.

Although Egypt and Sudan have firmly refused the agreement, it has become obvious that this rigid stance will not resolve the issue. This realization has pushed Egypt to shift its diplomacy regarding the issue, trading a harsh tone for attempts at exercising soft power, calling for more cooperation and joint projects.

"Egypt must first realize that it faces a major threat to its national security; water is vital to a major agricultural country like Egypt, and the Nile provides the country with 86 percent of its water needs and about 92 percent of the water used in agriculture," explains Mohamed Ibrahim, an assistant professor of agricultural economics at Alexandria University.

Ibrahim adds that in order to resolve this crisis, Egypt has to adopt a multi-dimensional strategy. Diplomatically, Egypt must show more flexibility toward the terms of the new Nile Basin cooperative agreement and more openness to negotiate. Economically, Egypt has to help fund agricultural and development projects in the other Nile Basin countries as well as work on finding



better ways to reduce wasted water that results from inefficient, old-fashioned practices of rolling out threats of military actions."

Egypt began taking friendlier approaches toward the other Nile Basin countries right after the revolution, making up for decades of distancing itself from its African neighbors. One of the first moves came from a public initiative conducted in March 2011 by prominent politicians, former diplomats and youth leaders accompanying former Prime Minister Essam Sharaf on his visit to the upstream countries of Uganda and Ethiopia in attempts to pave the way for better relations.

Along with Egypt's recent pledges to significantly boost trade and investment ties with Nile Basin countries, many analysts saw the appointment of Hesham Qandil as prime minister as another significant sign of Egypt putting the Nile issue at the top of its agenda.

Working as water resources and irrigation minister before his appointment as head of the Cabinet, Qandil is believed to be the architect of a new phase of relations between Egypt and its largest Nile Basin partner, Ethiopia.

Qandil was also behind President Morsy's visit to Addis Ababa last month, which was regarded by many as a historical turning point after the tense relations of past years. When Morsy attended an African Union summit in the Ethiopian capital, it was the first time in over a decade than an Egyptian president had attended the conference in person.

During his post as water resources and irrigation minister, Qandil ensured that Egypt places relations with African countries atop its priorities and pays attention to cooperation and economic and trade integration with African states in general and Nile Basin countries in particular.

"Egypt does not mind the establishment of projects by the Nile Basin countries within the area of exchanged benefit and not harming others, as we believe that cooperation with the Nile Basin countries is a must and it encourages development projects in the Nile Basin countries," Qandil said in a statement prior to President Morsy's visit to Ethiopia.

After the failed assassination attempt on former President Hosni Mubarak in Addis Ababa in 1994, he did not conduct a single diplomatic visit to a Nile downstream country. This has led to further



deterioration in relations between Egypt and these vital countries, especially Ethiopia, from which Egypt receives almost 75 percent of its water supply.

Nile Basin countries have long called for a new treaty to delineate a more equitable distribution of water. After almost 10 years of lengthy negotiations, the Cooperative Framework Agreement was formulated in 2010 and was immediately signed by Ethiopia, Kenya, Rwanda, Uganda and Tanzania. Burundi signed a year later.

The Democratic Republic of the Congo has abstained from signing for the time being, preferring more negotiations. Egypt and Sudan have refused to sign, declaring their stand behind a 1959 sharing agreement allocating them a majority of the water. The 1959 agreement came as a revisited version of the first agreement dating back to 1929, formulated between Egypt and Britain on behalf of Britain's African colonies. It gave Egypt veto power over upstream projects and the lion's share of Nile water.

In 1959, the agreement was revised between Egypt and Sudan, giving the two countries absolute rights to use 90 percent of the river's waters. According to the current 1959 Nile agreement that is still in place today, Egypt has exclusive use of 55.5 billion cubic meters — or 87 percent of the Nile flow — with Sudan enjoying the exploitation of 18.5 cubic meters of the water.

Nader Noureddin, a professor in the Faculty of Agriculture at Cairo University, tells Egypt Independent that the water system in the upstream countries is complex; in the past these countries were dependent on rainfall since they were located in humid areas, with average rainfall ranging from 1,250 to 1,500 millimeters each year.

Rainfall drops up to 500 millimeters in Eritrea and Sudan while in Egypt it does not exceed 15 millimeters annually; however, due to climate changes and development projects, a need for new resources has emerged, especially in countries like Ethiopia, which suffers from periodic droughts.

Yet Noureddin stresses that Africa is becoming the new food basket of the world, emphasizing that many new players are entering the equation since all countries are searching to secure the continent's water supply.



He explains that Israel, China, India, countries in the Gulf, and some multinational companies are conducting large-scale, industrial agricultural operations that consume massive amounts of water, utilizing this untapped access to irrigation and fertile wetlands.

Currently, several upstream nations are planning to build hydroelectric dams, including Ethiopia's major project of a US\$520 million hydroelectric dam on a Nile tributary, which is part of a decadelong project to create a modern electricity infrastructure financed by Italy, Ethiopia and the European Investment Bank.

According to Ethiopian media reports, however, Egyptian officials concede that the hydroelectric dams will not significantly hurt Egyptian consumption. On the other hand, agricultural projects should be more damaging to Egypt as they permanently reduce the amount of water that reaches the arid country.

Noureddin emphasizes the seriousness of Egypt's current situation, saying that per capita water use in Egypt is less than 600 cubic meters, significantly lower than the world standard of 1,000. This is mostly made up of agricultural water use, since fresh water consumption only amounts to under 20 percent of the total.

Noureddin warns that Egypt will need nearly 50 percent more Nile water by 2050 to cater to an estimated population of 150 million people, the number predicted by Egypt's National Planning Institute.

"Rift on the Nile: Challenges lie ahead for Nile water sharing", Egypt Independent, 18/08/2012, online at: <u>http://mideastenvironment.apps01.yorku.ca/?p=5702</u>

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Quest for Water

Arab countries lie within a band roughly between fifteen and thirty degrees north of the Earth's equator. This desert belt stretches for eight thousand kilometers, from the coast of the eastern Atlantic to the Arabian Sea. It encompasses the Great Sahara of North Africa and the desert of the Arabian Peninsula. In this region, only three major rivers, the Nile, Tigris, and Euphrates, supply narrow strips of land with year-round water. The rest of the region must depend on groundwater resources.

The Arab desert belt is among the driest regions of the world. The Great Sahara constitutes the largest and driest stretch of land on Earth, extending nearly six thousand kilometers from east to west. In its eastern part, the received solar radiation is capable of evaporating two hundred times its actual rainfall. This measure of dryness, the Aridity Index (AI), for the rest of the Arab deserts varies from 100 to 50. By way of comparison, the driest place in North America is Death Valley in California; its AI is 7.

The hyper arid conditions in most of the Arab lands necessitate dependence on groundwater resources. The quest for water is an urgent priority for people and policy makers alike in the countries of the Arabian Gulf region, for one example. These countries are endowed with plentiful oil resources, which are used among other things for local sea-water desalination to produce water for human consumption. Agriculture, however, must depend on groundwater, and population growth has exacerbated the scarcity of water.

A Plentiful Resource

The Earth is aptly called the Blue Planet because water covers over 70 percent of its surface. Views from space clearly depict continents as islands floating in a vast sea. The salt water in the oceans and seas constitutes 97 percent of all water on Earth. Tangible, visible fresh water bodies constitute a negligible fraction of the store of sweet water in the remaining 3 percent. Polar ice masses and mountain glaciers contain nearly 70 percent of all Earth's fresh water. Groundwater represents the remaining 30 percent, while surface water amounts to less than 1 percent of fresh water resources. This means that there is thirty times more water beneath the ground than in the fresh water of all the rivers, fresh water lakes, and swamps on Earth.



There is little question, then, that we must ponder where these invisible water resources are hidden in order to wisely locate, use, and manage them. In the Arab region, groundwater is both more prevalent and more extensive than generally believed, particularly in sand covered deserts far from population centers. However, it is important to note that such water accumulated during wetter climates in our geological past. This means that they are being infrequently replenished today, and must be properly managed to ensure sustainability.

There is a common misperception in the Middle East that groundwater resources are limited and undependable. This belief arises in part because too many wells are drilled within close distance of each other and, in most cases, are drilled to the same depth. Another reason for the misperception is that water is typically pumped at rates that are much higher than the mobility rate of water through the pore spaces in the host rock. The practice of unregulated water extraction has led to the notion that groundwater resources have been depleted in much of the Arab region. However, the resources are there but they must be mapped thoroughly, used wisely, and managed properly.

The groundwater story begins when rainwater accumulates on the Earth's surface. The driving force for its movement into the ground is gravity, which causes water to move from higher to lower elevations. Water moving beneath the surface is protected from the heat and evaporation caused by solar radiation, and will remain trapped in the fabric of the rock for thousands of years. During its journey, water will move through primary porosity (the open spaces between grains of soft sedimentary rocks) and/or secondary porosity (the faults and fractures in any rock type). Many people erroneously believe that water beneath the surface takes the form of underground lakes and rivers. In fact, the water in the ground exists mostly in pore spaces between rock grains.

Rock composed mostly of adjoining sand grains, sandstone, and others, such as limestone, have irregular yet connected pore spaces that allow water free passage. Water percolates through such rocks to move from higher to lower areas. Sandstone is generally salt free, and its confined water remains sweet and drinkable for thousands of years. On the other hand, limestone rocks contain soluble chemicals and passing water dissolves the salts and in some cases, the dissolution of salts within the host rock renders its water reserves saltier than that of the sea.



Vast groundwater basins may be up to hundreds of meters in capacity as is the case of the Nubian aquifers of North Africa, and the Empty Quarter basin of the Arabian Peninsula. Here and there, such extensive, seemingly horizontal sandstone aquifers are interrupted by non-porous rock masses, including igneous and volcanic rocks.

The direction of surface water runoff depends on topography; the greater the degree of tilt, the faster the runoff. However, the pattern usually depends on the orientation of faults and fractures in the surface rock. As surface water denudes the rock to establish an easy passageway, a drainage pattern emerges. The pointed tips of the often V-shaped pathway intersections indicate the direction of downward water flow. As such, dry *wadi* patterns indicate topography at the time of formation. Therefore, the analysis of patterns visible on land from running surface water is essential to the prediction of groundwater accumulation sites.

Pictures from Space

The modern search for groundwater has been aided immeasurably by satellite technology, but signs of the resource have always been apparent. Sparsely populated areas in the Middle East have depended for generations on water that percolated through fractures from higher topography to exit in the form of springs, or oases. These are called *wahat* in North Africa, *oyoun* in the Eastern Mediterranean, and *aflaj* in southern Arabia.

In some cases, water is known to follow such fractures for extended distances and release water for long periods of time. For example, Bir Zamzam is an open well near Mecca in the Hijaz Mountains of western Saudi Arabia. It receives its water, via fractures in the surrounding rocks, from seasonal rainfall or snowmelt—as it has done for thousands of years. The water level may increase or decrease occasionally, but the flow of its highly prized water is constant.

Pearl divers in the Gulf, in fact, benefited from this phenomenon for centuries. Prior to the modern oil era, the economy of the region depended on harvesting pearls from the sea. Rainwater from the Hijaz Mountains also found its way through fractures in the rock to exit at the bottom of the Gulf, a distance of nearly one thousand kilometers. To obtain drinking water supplies during their hunt in the sea, a pearl fishing party would send a diver carrying a rock—for fast descent—tied to a rope. The



diver would locate the fresh water emanating from the bottom of the otherwise highly saline Gulf water and fill a goat skin *girba*. When finished, the diver would signal by tugging the rope and would be pulled back to the vessel. The process was repeated until the party had enough drinking water for their pearl-foraging mission.

Until recently, no one had established a plausible explanation as to the source of the fresh water springs on the Gulf floor. Most experts had discounted the distant Hijaz Mountains as its source, suggesting instead that the water must have seeped from nearby rocks. However, the latter are composed mostly of limestone, which contains, as mentioned, salts and so the groundwater in these rocks is rather saline.

The Hijaz theory gained tangible support after field exploration of the environmental effects of the Gulf War of 1991. My own observations of the desert surface of Kuwait suggest that the whole area is basically the dry delta of an ancient river. The surface was covered by round cobbles, pebbles, and grains made of the igneous and volcanic rock found in the Hijaz Mountains. This led me to map the "Arabia River," a passageway of surface water from the Hijaz all the way to western Kuwait, a distance of 850 kilometers. The theory being that if surface water made the journey along a fracture that crossed Arabia from west to east, then similar cracks in the subsurface could do the same. These findings were established not only by field observations but also via essential satellite images.

The Arabia River case illustrates how, for every surface feature that we can distinguish in the arid lands of today, there is the backstory of how, when, and by what mechanism it was created. The variety of such features makes it essential to study, in detail, the entire surface of the desert in order to be able to understand its history. Thus, the study of landforms over vast areas of the Arab region requires a bird's eye view and satellite images are the best source of information on desert regions, especially for groundwater exploration.

Imaging the Earth from space has progressively advanced over the past forty-five years. In the mid-1960s, photographs were taken by the astronauts on the Gemini, Apollo, Skylab, and Apollo-Soyuz missions using hand-held cameras with color film. Ancient rocks, with much iron and other dark elements appeared brown, limestone looked bright, sands appeared golden yellow, and ocean currents



became discernible. And so we began to map Earth's hard to reach regions based solely on views from space.

The detail of images from space depends, of course, on the altitude of the spacecraft; the lower the orbit, the higher the resolution. It also depends on the focal length of the camera lens; the longer the length, the greater the detail. In the first satellite images, a whole town appeared as a dot. Today a car can be clearly identified in high-resolution images.

Digital imaging from space allows the use of filters to separate the reflected light into various wavelengths. For example, when certain bands of Landsat are used, they become equivalent to visible light. These multi-spectral bands could be combined with an infrared band, or a thermal band that measures differences in the temperatures of rock, soil, and sand.

There is the promise of expanding efforts to utilize satellite imaging for groundwater discoveries in the Middle East. In the past few years, several Arab countries have launched imaging satellites. Saudi Arabia was the first, followed by Egypt, which operates a multi-spectral imaging system with 7.8 meter ground resolution. Algeria is planning one and the United Arab Emirates is also considering one such project.

A combination of all available satellite image data is ideal for investigating the probability of groundwater concentration in the Arab desert. These data include:

1. Multi-spectral images that clearly depict the surface features and allow the deduction of their geologic history.

2. Thermal images that show the location of rainwater accumulation just below the surface, which may replenish groundwater aquifers, as well as seepage of groundwater into the sea along coastal zones.

3. Radar waves that penetrate sand cover to reveal buried river courses.

4. Elevation data that depict the direction of surface water flow in the past as well as in the present.



The correlation of such data using Geographic Information System (GIS) methods allows us to define the best way to locate and utilize groundwater resources.

Case Studies: Egypt and Sudan

Egypt and Sudan are two examples of locating previously unknown groundwater resources using satellite images in the heart of the eastern part of the Great Sahara. Although the Sahara is now dry and is subject to the action of strong winds from the north, archaeological evidence indicates that it hosted much wetter climates in the past allowing rainwater to accumulate in depressions and seep through the substrate to form the Nubian aquifers. These aquifers were confined to two distinct basins—rather than the one vast layer extending from Chad to the Mediterranean Sea as has been previously postulated.

In southwest Egypt, a three-hundred-kilometer flat and sand-covered area straddles the border between Egypt and Sudan. This region is called the Great Selima Sand Sheet, with the Selima Oasis on its eastern border. This oasis is a prominent way station on the Darb El-Arbain (the forty-day trek) of camel caravans from Darfur in northwestern Sudan to the Nile valley in Egypt. Faint drainage lines that led to the sand sheet from the west and its general setting suggested the potential of groundwater accumulation within the basin, although there was no tangible evidence of water.

In 1980, the Egyptian government planned to establish a military base in southwest Egypt. As a science advisor to President Anwar Sadat, I completed a survey of Egypt's Western Desert. The survey proved that sand in the vast dunes originated from water and was deposited in topographic depressions during previous wet climatic eras. The sand was later shaped into dunes during dry episodes. However, neither the transportation pathways nor the depositional basins could be seen in early satellite images, and the theory lacked tangible evidence.

In November 1981, during the first flight of the Space Shuttle Imaging Radar mission, the instrument was aimed at a flat region in northwest Sudan. Its imagery revealed sand-buried courses of river channels just south of the border of Egypt. I then postulated that the flat area in southwest Egypt—part of the Great Selima Sand Sheet—was one depression where water collected during past humid episodes.



The site was approved for groundwater exploration wells in 1982. However, when the strategic need for the military base ended, so did the interest in the wells. I continued to campaign for test wells to evaluate the groundwater potential of the region. It took thirteen years before testing finally began, and proved the existence of sweet water in vast amounts. Water showed up at one hundred meters below the surface and rose to twenty-five meters below the ground under its own pressure. The water had only two hundred parts-per-million salts, which made it sweeter than that of the Nile River.

In 1995, the Egyptian government offered a number of ten-thousand-acre plots to agricultural endeavors in order to develop the land. Today, 750,000 acres utilizing nearly one thousand wells are actively producing wheat, chickpeas, peanuts, and other crops at considerable profit. The proven water reserves in the region would support agriculture over at least 150,000 acres for one hundred years. Since then, my team has mapped five main stream channels emanating from the Gilf Kebir highlands in southwest Egypt that fed rainwater there in the past. The accumulated water in the depression seeped into the porous sandstone substrate as groundwater and this suggests that the resource might be even greater than estimated.

The second case is just south of the Egyptian border in the Darfur region of northwestern Sudan. This arid home of the Fur tribe is presently divided into three governorates: north, west, and south. (It is now being considered for division into four governorates.) The governorate of North Darfur in particular hosts an environment typical of the eastern Sahara of North Africa: the farther north one goes, toward Egypt and Libya, the greater the aridity.

A mountain range, Jabal Marra, straddles the three governorates. It does receive some annual rainfall, particularly at the end of summer, but severe droughts over the past two decades have caused population migration along the fringe of the Sahel belt of North Africa. Competition for the meager water resources in the Darfur region contributed to the conflict there as farming communities settled around wells that were considered to belong to nomadic populations. The latter inflicted much damage to the numerous farms and caused the severe humanitarian crisis. Darfur is yet another example of the desperate need for additional water resources.

Interpretations of space-borne data were then conducted at the Boston University Center for Remote Sensing and resulted in the identification of horizontal lines at an elevation of 573 meters above sea



level in northern Darfur. Detailed geologic analysis of these discontinuous lines confirmed that they were remnants of shorelines of an ancient mega lake.

Modeling of the ancient lake basin showed that at its maximum extent, the lake had occupied an area of about 30,750 square kilometers, the size of Lake Erie in North America. It would have contained approximately 2,530 cubic meters of water when filled. The enormity of the lake's size and the topographic setting of the area suggest that this lake was formed during wet epochs, when rain was plentiful, over a protracted period of time. And, just as in the case of the basin to the north in southwest Egypt, much of the rainwater would have seeped into the substrate to form groundwater.

After completing the mapping of the lake boundaries using the space data, I conveyed the outcome to officials of the Sudanese government, prompting them to launch the "One Thousand Wells for Darfur" initiative. The map survey was also conveyed to and welcomed by officials in North Darfur, as well as at the United Nations.

Water for the Future

Vast tracts in the Arab region have not been similarly explored for their groundwater potential. This includes the extensive sand covered plains of the Great Sahara and the Empty Quarter of Arabia. Ongoing geological discoveries could make such exploration even more fruitful. For example, there are new indications that desert sands were transported and deposited by running surface water during humid climates that alternated with dry phases in the geological past. The last of the wet phases ended about five thousand years ago. During dry phases, like the present one, the wind acts on the sand deposits to shape desert dunes. As discussed earlier, because desert sands were formed and transported by water, their locations might be underlain by groundwater.

The evaluation of such resources belongs in the policy domain. Government bodies must collect and analyze the required data to regulate groundwater use. It is also essential that the attention of policy makers be sustained in the long term, because data collection and evaluation require a great amount of time. Thus, it is instructive to consider the major issues that require institutional regulation by policy makers. The primary need is to map the boundaries of each groundwater basin or aquifer using all available space images and field-collected data. This should be followed by exploration wells to



establish the depth of the groundwater level. In many cases, the water exists in several levels beneath the surface.

Next, modeling should be performed to establish how much water is contained in each aquifer. Data on salinity must be integrated into the models with emphasis on changes over time. In some cases, over-pumping draws water from saline sources and contaminates sweet water. This modeling is essential to establish safe pumping rates to assure sustainability. A glaring example of over-pumping with little or no regulation is that of the Al-Qasim region in central Saudi Arabia. There, unregulated extraction of groundwater for wheat production in the 1980s and 1990s exhausted the resource and led to the abandonment of numerous fields.

Furthermore, regulations are necessary to establish the proper use of the water. In some cases, it is best to use the water for *in situ* agriculture, such as in southwest Egypt. In other cases, the water should be transported to populated areas, such as Libya's "Great Man Made River Project."

In the case of groundwater in desert basins, it is essential that regulations consider the resource fossil water. It accumulated during wet episodes that lasted for thousands of years in the mists of our geological past. It must be remembered that replenishment may occur in some minimal locations along mountain ranges, but the open desert very rarely receives any rainfall, let alone enough to replenish groundwater below. From a policy regulation point of view, this groundwater must be considered a finite resource that will run out in a given period of time.

Clearly, where groundwater aquifers extend beyond national boundaries these extensive areas require study and evaluation to establish regulations for the equitable distribution of water resources. In this case, policy regulations and governance need to be inter-governmental. And it is advisable to collect the necessary information now, to avoid future problems when the available resources will be insufficient to satisfy increasingly desperate needs.

The current major shared groundwater aquifers in the Arab region include:

-The Palestine expanse in Israel and the West Bank;

- -The Jordan River system in Jordan, Israel, and the West Bank;
- -The Hamad basin in Syria, Jordan, Israel, and the West Bank;



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- -The eastern Mediterranean system in Lebanon and Syria;
- -The Tabuk fracture zone aquifer in Jordan and Saudi Arabia;
- -The Selima basin in Egypt and Sudan;
- -The Siwa-Jaghboub system in Egypt and Libya.

While the Arab region's groundwater resources remain to be comprehensively charted, the already voluminous literature on groundwater in the region indicates four noteworthy points:

1. Vast areas of the Arabian deserts have not yet been studied or explored.

2. Current water scarcity will be further exacerbated by rapid population growth and increasing water usage.

3. Productive aquifers are being over-drilled and over-pumped with little regulation to assure their sustainability.

4. Aquifers shared by multiple nations have not been quantified for equitable use.

Thus, a major study of the Arab region should be initiated, with the purpose of identifying regions of potential groundwater accumulation. All available data must be collected for each country or region; because using only parts of the data might be misleading. The data should be processed, analyzed, correlated, and updated in an active GIS database. The information within this database should be freely exchanged for the planning of equitable uses of groundwater resources in adjacent countries. And countries should place a high priority on proper utilization of this valuable resource.

In addition, it is essential to construct a complete digital database for currently exploited groundwater resources. The database should be regularly updated based on new findings or more advanced analysis and modeling methodologies. The same should be done for currently shared water resources to establish inter-governmental agreements for utilizing resources that straddle international boundaries.

Data collection should be required in all regions where water might be extracted for human consumption as well as for agricultural or industrial uses: data such as geo-coded locations of the wells, their depth, and the type of host rock; water salinity; pumping rates; and historical illustrations of changes to water levels over space and time. All such data are essential for the proper assessment



of actively mined resources and the establishment of a proper water extraction rate to assure the longevity of a given aquifer.

Arabian groundwater resources require more study and better regulation. These objectives need sustained attention by policy makers, who must put their emphasis on long-term sustainable development. Concerted efforts are needed today, so that there is water tomorrow.

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"Quest for Water",18/08/2012, online at: http://www.aucegypt.edu/GAPP/CairoReview/Pages/articleDetails.aspx?aid=166

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* Middle East to Spend \$32.7 Billion on New Energy Projects this Year

Ventures Middle East, a strategic business advisory company, has recently performed a study of the Middle East and concluded that in 2012 97 new power and water projects worth \$32.7 billion have started construction, or will start construction before the end of the year.

The UAE has 10 energy and water projects worth a total of \$1.5 billion set to begin construction this year, headed by the \$740 million Noor 1 Solar Power Plant, and Phase 2 of the \$580 million Emal Power Plant.

19 power and water projects will be started this year in Kuwait with a combined cost of \$4.2 billion, led by the \$2.7 billion Al Zour North Independent Water and Power Plant.

Saudi Arabia has approved 15 new projects for 2012 worth a total of \$8.8 billion, including the \$2 billion Al Qurayyah Independent Power Plant, and the \$1.2 billion Shuaiba 2 Power Plant.

Other Middle Eastern Countries with energy or water projects due to begin construction this year include; Morocco, Egypt, Oman, Qatar, Jordan, Iraq, Yemen, Syria, and Bahrain.

"Middle East to Spend \$32.7 Billion on New Energy Projects this Year", 16/08/2012, online at: <u>http://oilprice.com/Latest-Energy-News/World-News/Middle-East-to-Spend-32.7-Billion-on-New-Energy-Projects-this-Year.html</u>

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South African High Court Sides With Water Consumers in Mpumalanga Province

South Africa, MBOMBELA — A South African High Court last week ruled in favor of water consumers in Mpumalanga Province, ordering two municipal council water providers to supply, without fail, at least 25 liters of clean water per day to residents.

In a precedent-setting case that could open the floodgates for similar suits in other municipalities, the court dismissed efforts by Gert Sibande and Chief Albert Luthuli municipalities to block an earlier directive requiring them to supply clean water to residents.

It was not immediately clear what the penalty would be if the municipalities failed to comply with the ruling.

Local residents told High Court judge Moses Mavundla that for seven months, the two municipalities, which have a combined population of one million people, were supplied with water that had been contaminated by waste from coal mines in the Mpumalanga area.

Chief Albert Luthuli Municipality Mayor B. P. Shiba insisted last month that the municipality had never knowingly supplied contaminated water for human consumption.

She said that early this year, the Water and Environmental Affairs Ministry had confirmed that the municipality was supplying clean water to the residents.

However, a taskforce formed later to investigate water quality in the provincial town of Carolina found that water supply contained heavy metals including iron, aluminum and manganese, "which can be traced to the mining activity in the surrounding areas."

This meant that water from that plant was no longer suitable for human consumption, but could be used for non-potable purposes.

Shiba said any water quality problems in Carolina were "unfortunate" but were not of "the municipal council personnel's making."



"In January 2012 our raw water from Boesmanspruit Dam was contaminated with acid mine water seepage, and this resulted in a dramatic change in the supply of portable water that is purified in that plant and provided to communities in Carolina and surrounding farm areas," she explained.

"Even though this problem was not the municipality or any of its personnel's doing, we established a task team comprising various stakeholders, which included the Inkomati Catchment Agency, the Department of Water Affairs, technical personnel from the municipality, surrounding mines, community development workers, and other agencies to identify the problem and provide us with both short-term and long-term solutions to the problem," Shiba said.

"South African High Court Sides With Water Consumers in Mpumalanga Province", 14/08/2012, online at: <u>http://www.ooskanews.com/daily-water-briefing/south-african-high-court-sides-water-consumers-mpumalanga-province_23849</u>

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China's Bureaucracy Partly to Blame for Water Problems

united states, MI, EAST LANSING — China faces a wide array of freshwater problems, from contamination to flooding and droughts, all of which can partially be blamed on a top-down bureaucracy that does not coordinate well among the different divisions, according to a new report from Michigan State University researchers.

The report, "Water Sustainability for China and Beyond," published in the journal Science on August 10, argues that this type of bureaucracy, which is not unique to China, makes it more difficult to deal with long-term sustainability issues.

"People don't communicate well and do not coordinate well and just try to achieve one goal at a time," Reuters quoted lead author Jianguo Liu, director of Michigan State University's Center for Systems Integration and Sustainability, as saying.

China has spent almost \$700 billion USD on water projects, mostly large engineering feats like the South-to-North Water Diversion Project. Regardless, progress on fixing its long-term problems is slow in coming.

As OOSKAnews reported earlier this week, the Chinese Environment Ministry has found that groundwater at 57 percent of monitoring sites throughout the country are polluted or extremely polluted.

The ministry also found that only two out of the nation's seven main water systems have good quality water -- the Yangtze and Pearl rivers. The Haihe River is heavily polluted, and the other four are all moderately polluted.

For this reason, Liu suggests a big-picture view beyond these big engineering projects.

"There is an inescapable complexity with water. When you generate energy, you need water; when you produce food, you need water. However, to provide more water, more energy and more land are needed, thus creating more challenges for energy and food production, which in turn use more water and pollute more water," Liu was quoted in Science Blog as saying.



"In the end, goals are often contradictory to each other. Everybody wants something, but doesn't take a systems approach that is essential for us to see the whole picture."

Liu and doctoral student Wu Yang made several suggestions that can be applied beyond China. They urge authorities to provide coordination among organizations with clearly defined roles and goals; engage the public; get proactive and set criteria; use social sciences to better understand the relationship between human and nature and then apply this to future planning; and remember that sharing international waterways has significant impacts on quality and sustainability.

"China's Bureaucracy Partly to Blame for Water Problems", 13/08/2012, online at: <u>http://www.ooskanews.com/daily-water-briefing/china-s-bureaucracy-partly-blame-water-problems</u> 23844

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Chinese Government, Liaoning Officials Sign Agreement to Prevent Pollution in Liaohe River

China, SHENYANG — Officials from China's Ministry of Finance, the National Development and Reform Commission and the Department of Environmental Protection last week signed an agreement with the government of Liaoning province to prevent pollution of the Liaohe River.

The Liaohe River has long faced serious water quality problems, and has been categorized as "heavily polluted."

The agreement puts the province fully in charge of managing water quality in the river by strengthening regulations and oversight as well as delegating tasks related to pollution prevention.

For their part, the federal agencies will offer guidance and support on policy and capital investment.

The agreement aims to ensure that the Liaohe River achieves grade IV water quality (the highest water quality category is grade I) by the end of this year.

Water quality in the main branch of the Hun, Prince Edward and Daliao rivers, tributaries of the Liaohe, has already reached grade IV.

By the end of 2015, the aquatic ecosystem in the Liaohe protected areas is expected to recover at least partially.

At that time, the province hopes to become a model of sustainable basin management. It will establish an advance warning system for environmental monitoring.

China's 12th Five-Year Plan calls for preventive measure to protect the water quality of the Liaohe River.

The Department of Environmental Protection has assessed the implementation of prevention programs so far, and this will be used as a reference for future budget allocations.

"Chinese Government, Liaoning Officials Sign Agreement to Prevent Pollution in Liaohe River", 14/08/2012, online at: http://www.ooskanews.com/daily-water-briefing/chinese-government-liaoning-officials-sign-agreement-preventpollution-liaohe-r

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* China's "Thirst" for Coal Exacerbates Water Crisis: Greenpeace

BEIJING, China — Since all aspects of the coal industry, from mining to electricity generation, are highly water-intensive, China's "thirst" for coal energy will "inevitably trigger a serious water crisis and exacerbate existing water scarcity problems," according to a new report from international environmental group Greenpeace.

The report, "Thirsty Coal: A Water Crisis Exacerbated by China's New Mega Coal Power Bases," based on commissioned research, found that water demand for the coal industry will increase to at least 9.975 billion cubic meters in 2015.

This is the equivalent to one-sixth the annual flow of the Yellow River, according to the report.

Under its 12th Five-Year Plan (2011-15), the Chinese government plans to construct 16 large-scale coal power bases. Seven of these will be built in arid western areas -- the Shendong, Mengdong, Jinbei, Jinzhong, Jindong, Ningdong and Shaanbei bases will be located in Inner-Mongolia, Shanxi, Shaanxi and Ningxia.

These bases will have a combined coal output of 2.2 billion tons, which will equate to 56 percent of China's annual coal output in 2015.

With this level of output, the bases will put tremendous strain on the water resources available in this region, according to the report.

"The water demand of coal power bases in Inner Mongolia, Shaanxi, Shanxi and Ningxia will either severely challenge or exceed the respective areas' total industrial water supply capacity," it said. "Thus, the development of coal-related industries in these areas will take up a significant amount of water currently allocated to non-industrial uses, such as farming, drinking water and ecological conservation."

The report also warns that social unrest could result from an "unchecked" mining industry. It pointed to protests that have taken place in Inner Mongolia due to poorly planned and unregulated coal extraction activities.



"Greenpeace strongly urges China to reconsider the distribution and scale of its coal power expansion strategy, watch over the water supply situation in its mega coal power bases, and make adjustments to these ambitious plans in accordance to availability and sustainability of water resources in western China over the remaining time left in the 12th Five-Year Plan period," it concluded.

Greenpeace is not the only international organization to express concerns over China's coal production plans. OOSKAnews reported in June that GE Director of Global Strategy and Planning Peter Evans was concerned about the lack of properly considering water needed in a coal plant's cooling process.

"They [the Chinese] have not introduced a water constraint on their model," Evans was quoted as saying. "They assume the water is there. So my view is that they actually will not be able to build as many coal plants as the projections suggest."

World Resources Institute (WRI) Senior Associate Charles Iceland told OOSKAnews via email that "the take-home message for public and private sector decision-makers is that they will have to make large-scale adjustments in a relatively short time period in order to adapt to a rapidly changing water resource reality."

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[&]quot;China's "Thirst" for Coal Exacerbates Water Crisis: Greenpeace", 15/08/2012, online at: http://www.ooskanews.com/daily-water-briefing/china-s-thirst-coal-exacerbates-water-crisis-greenpeace 23889



> Thousands face lack of drinking water due to rising temperatures

CHONGQING, Aug. 16 (Xinhua) -- Thousands of people in central and southwest China are facing drinking water shortages because of insufficient rainfall and scorching heat.

In the southwestern Chongqing Municipality, 79,000 residents in the mountainous regions are facing temporary water shortages after rainfall in the megacity has seen a 20 percent to 60 percent year-on-year drop since June, according to sources at the local flood control and drought relief office.

Chongqing has suffered from hot days with maximum temperatures at above 38 degree centigrade since early August, statistics from the local meteorological observatory showed.

Government officials supervising drought relief in the city have been urged to store water from torrential rains, which are expected to come during the current flood season. The rains should be channelled to drought-hit areas or reservoirs.

Statistics show that water conservation projects in Chongqing are holding more water than the same period last year.

However, China's Central Meteorological Observatory has said the maximum temperature in Chongqing is forecast to hit 40 degree centigrade in the coming days, triggering further concerns. Crops are withering in the dry and cracked fields in central China.

In Suizhou City of Hubei Province, where maximum temperatures have been as high as 35 degree centigrade, since July, insufficient rainfall over the past 25 months is endangering the drinking water supply for more than 520,000 local residents and 160,000 livestock.

In Langhe Village, worst hit in Suizhou, nearly one third of the total 233 hectares of land is expected to yield nothing.

"Another one third of the land will only yield 40 percent of what it should have produced," moaned the village chief Lu Renfu.

The 53-year-old said the ongoing drought is the worst he has ever seen in all his life.



Zhan Shengquan, deputy head of the government of Hedian Township, where Lu's village is located, told Xinhua the water storage of the largest reservoir in the township had shrunk to 3.5 million cubic meters, from over 46 million cubic meters, as the drought continues.

"We do not have enough water supply for the residents, let alone for the irrigation," said Zhan.

Suizhou received only 340 mm of rainfall since mid-July - only half of previous years and the least since 1957, when the city's first meteorological log could be traced, according to deputy head of the city's Drought Relief and Flood Control Office Yu Pengcheng.

Extreme weathers are also gripping other parts of China, where the south is bracing for Kai-Tak, a tropical storm that has developed into a typhoon. Elsewhere, the north is expected to be lashed by torrential rains.

"Thousands face lack of drinking water due to rising temperatures", 16/08/2012, online at: http://news.xinhuanet.com/english/china/2012-08/16/c_131790046.htm

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* Work restarts at Xayaburi dam in Laos -project leader

(Reuters) - Work has resumed on a controversial \$3.5 billion dam across the Mekong River in Laos, its Thai developer said on Thursday, contradicting Laotian assurances it had been suspended following protests over its environmental impact.

Laos agreed in December to suspend the Xayaburi dam project and said on July 13 work had stopped after neighbors' Cambodia and Vietnam repeatedly expressed concern that the 1,285 megawatt dam would harm migratory fish and the livelihood of downstream villages.

"We are still working on the project. We haven't received a formal letter from the Lao government that we should suspend or put the project on hold," Plew Trivisvavet, Chief Executive Officer at Thailand's Ch Karnchang Pcl, told reporters.

The government of Laos made no immediate comment.

The dam would be the first along the main stream of the Mekong in Southeast Asia. It is at the heart of landlocked Laos' ambitions to become the hydropower battery of Southeast Asia, with <u>Thailand</u> the main buyer of the energy. Environmentalists fear it could clear the way for more dams across the mighty Mekong, one of Asia's biggest rivers.

On December 8, the Mekong River Commission, comprising Cambodia, Laos, Thailand and Vietnam, said member governments agreed to approach the Japanese government and other international development partners to further study the dam's implications before giving Laos the go-ahead to continue construction.

But Ch Karnchang, the dam's main contractor, expects to begin construction of a reservoir at the site later this year, said Plew. "We have entered the area for some relocation work and to prepare for the construction of the reservoir," he said.



ENVIRONMENTAL CONCERNS

Communist Laos has hailed Xayaburi as a model for clean, green energy that will stimulate its tiny \$6 billion economy and improve the lives of its 5.9 million people, over a quarter of whom live below the poverty line, many without electricity.

It is the first of 11 dams planned in the lower Mekong that are projected to generate 8 percent of energy-hungry Southeast Asia's power by 2025.

Environmentalists say Xayaburi could block the flow of nutrient-rich sediment to southern Vietnam's rice-growing Mekong Delta. State-controlled media in Vietnam have been uncharacteristically critical of the dam.

According to a study by the Mekong River Commission, an inter-government agency, the proposed 11 dams would turn 55 percent of the river into reservoirs, resulting in estimated agricultural losses of more than \$500 million a year and cutting the average protein intake of Thai and Lao people by 30 percent.

<u>China</u> has built four dams on the upper river, closer to its source, but they are equally controversial. Activists say they were responsible for a 2010 drought that sent lower Mekong water levels to their lowest in half a century.

Ch Karnchang's 50 percent-owned subsidiary, Xayaburi Power Co, has received a 29-year concession contract from the Laotian government to operate the dam's power plant.

Other shareholders in Xayaburi Power include Natee Synergy Co, a unit of PTT Pcl, Thailand's largest energy firm, with a 25 percent stake. Thailand's Electricity Generating Co has 12.5 percent, and Bangkok Expressway Pcl has 7.5 percent.

Xayaburi Power plans to sell the power to state-run Electricity Generating Authority of Thailand, the country's sole power distributor, in 2019, Plew said, adding Ch Karnchang planned to book revenue of about 4 billion baht (\$127 million) from the project this year.



Kasem Prunratanamata, head of research at CIMB Securities in Bangkok, said the Xayaburi dam has put pressure on Ch Karnchang's stock over concerns the environmental impact would lead to delays and raise costs.

Ch Karnchang shares have fallen 9 percent in the last 12 months, underperforming a 13 percent gain in Bangkok's broad index. By the midday break, the stock was unchanged at 7 baht, in line with a 0.3 percent rise in the main index. (\$1 = 31.5500 Thai baht)

"Work restarts at Xayaburi dam in Laos -project leader", 16/08/2012, online at: <u>http://www.reuters.com/article/2012/08/16/entertainment-us-thailand-laos-xayaburi-</u> idUSBRE87F09H20120816?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=25196326d1-<u>RSS_EMAIL_CAMPAIGN&utm_medium=email</u>

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Water reservoirs at 51 pct of capacity – govt

(Reuters) - Water levels in India's main reservoirs were at 51 percent of capacity in the week to August 16, down 12 percentage points from a year ago, reflecting this year's weak monsoon, government data showed on Thursday.

The latest level was equal to the 10-year average for the week. It was 9 percentage points higher than the previous week, reflecting improvement in the monsoon since the last week of July.

Reservoirs are primarily they important for hydropower, which accounts for a quarter of India's generation capacity, but they are also used during the summer for irrigation if monsoon rains are not enough for planting crops such as cotton.

The reservoirs provide water later in the year to irrigate winter crops such as wheat and rapeseed.

"Water reservoirs at 51 pct of capacity – govt", 16/08/2012, online at: <u>http://in.reuters.com/article/2012/08/16/india-reservoirs-</u> idINDEE87F09Z20120816?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=25196326d1-<u>RSS_EMAIL_CAMPAIGN&utm_medium=email</u>

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* Malawi to Launch "Green Revolution" Initiative

Malawi, LILONGWE — Malawi's Green Revolution Initiative, which aims to improve food security and alleviate the effects of climate change by harnessing Malawi's water resources for irrigated farming, will start at the end of September, according to Professor George Kanyama Phiri, coordinator of the Green Revolution Development Program.

The initiative would increase the area of farmland under irrigation from the current 90,000 hectares to 1 million hectares in a 28,750 square kilometer area near Lake Malawi and a 303-square-kilometer area along Lake Malombe.

In preparation for the initiative, Press Agriculture Limited handed over 6,290 hectares of land in the central lakeshore district of Salima to the Ministry of Lands and Housing for sugarcane cultivation.

"Construction of canals and pipes on 500 hectares of land, which will be used for growing seed for multiplication, already began last June," Kanyama Phiri said.

He said the Malawi government had already secured \$40 million USD in funding from the Indian government for a sugar manufacturing plant in the area.

The initiative will be implemented in phases, with phase one targeting the sugar plantation at Chikwawa Estate; the Nthola Ilora Ngosi system in the northern lakeshore district of Karonga, which will cultivate rice; the eastern Lake Malombe Rice Irrigation program in Mangochi; and the 42,000 hectare Shire Valley Chilengo program on the country's southern tip.

The coordinator said the target is to have a radius of 20 kilometers along the banks of the country's main water bodies under irrigation.

The sites were chosen on the basis of equity (one site in each region) as well as irrigation potential. The Shire Valley is a potential foodbasket, but is located in a rain shadow (a dry area on the leeward side of a mountainous area).

"Through the Green Belt Initiative, the government intends to increase productivity of crops from the current 25 percent to 50 percent, as well as improve livestock and fisheries," Kanyama Phiri said.



Ultimately, the country hopes to increase agricultural exports and foreign exchange earnings, produce more crops, diversify livestock and fisheries and improve value chain links and operations through increased private sector participation in agricultural production.

The initiative also aims to improve access to social infrastructure and support services, increase smallholder income levels and employment opportunities and expanding access to water for various uses.

Agriculture accounts for more than 80 percent of Malawi's export earnings and contributes 36 percent of the country's gross domestic product (GDP). It provides the main livelihood for 85 percent of the population. Smallholder farmers contribute about three-quarters of the country's agricultural production.

Despite a vast expanse of water systems, covering over 21 percent of the country's territory, Malawi depends on rain-fed agriculture to achieve food security.

This has led to low agricultural productivity due to weather shocks and natural disasters such as unreliable rainfall patterns, pests and disease, droughts and floods.

"As such, the government of Malawi has formulated the Greenbelt Initiative with the aim of using available water resources to increase production, productivity, incomes and food security at both household and national levels for economic growth and development," said Kanyama Phiri.

The program has the potential to transform Malawi from a predominantly consuming and importing country to a producing and exporting country, he said.

"Malawi to Launch "Green Revolution" Initiative", 13/08/2012, online at: <u>http://www.ooskanews.com/daily-water-briefing/malawi-launch-green-revolution-initiative_23829</u>

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Study Calls for Minimizing Wastewater Generation, and Reuse to Enhance Water Security

washington, dc, united states — Minimizing production of wastewater and then reusing what is generated are two equally important steps toward enhancing human water security, according to the new studyby US, Australian and South African researchers, published in the journal Science on August 10.

"These complementary options make the most of scarce freshwater resources, serve the varying water needs of both developed and developing countries, and confer a variety of environmental benefits. Their widespread adoption will require changing how freshwater is sourced, used, managed, and priced," according to the report, "Taking the 'Waste' Out of 'Wastewater' for Human Water Security and Ecosystem Sustainability."

Wastewater is already being reused in many parts of the world for industrial and agricultural needs, and even in some places, like Singapore, for domestic needs. But the report argues that regardless of current efforts there are still 4 billion people without truly adequate supplies of safe, potable water, and that number will only continue to grow due to pollution, inefficient use, climate change, and population growth.

"We need to focus on improving the productivity and value of existing supplies, which basically means getting more out of a glass of water," PHYS.org quoted Stanley Grant, a UC Irvine civil & environmental engineering professor and the study's lead author, as saying.

There are three major ways humans have already began to change their behavior towards water use and reuse -- substitution, regeneration, and reduction, the study found.

Substituting replaces use of high-quality freshwater with lower-quality water. For example, in Hong Kong, 80 percent of residential toilets use saltwater rather than freshwater for flushing.

Regeneration converts wastewater back into a usable commodity that is either pumped into groundwater supplies or kept within the domestic supply system, which cuts the cost of transporting the water long distances and is cheaper than desalination, according to the study.



Reduction involves decreasing the amount of water lost through leaks and poor accounting, which is almost half of all water supplied in the developing world. If only 25 percent of this loss was available for use, it could supply another 90 million people with freshwater, according to World Bank figures.

Fellow researchers from UC Irvine, as well as the University of Melbourne, Australia, South Africa's Monash University, UC Los Angeles, and the Scripps Institution of Oceanography were involved with the study.

"Study Calls for Minimizing Wastewater Generation, and Reuse to Enhance Water Security", 14/08/2012, online at: http://www.ooskanews.com/daily-water-briefing/study-calls-minimizing-wastewater-generation-and-reuse-enhancewater-security_2

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Brazil Suspends Massive Amazon Dam Construction

A Brazilian federal court Tuesday ordered to suspend the construction of the world's would-be third largest dam until affected indigenous communities get a hearing in Congress.

The controversial 11,000-megawatt dam, being built at a cost of 9.4 billion U.S. dollars, is located in northern Brazil's Belo Monte Amazon region. It would be the world's third largest, after China's Three Gorges hydroelectric plant and Brazil's southern Itaipu dam.

The suspension aims to allow communities in the vicinity of the Belo Monte dam to present their case to Congress, said the judges.

Construction must be suspended, otherwise the company conducting the project would be fined 500,000 Brazilian reais (247,500 U.S. dollars) daily.

The suspension can only be revoked after local communities' concerns have been aired in Congress, the judges added.

Norte Energia, the consortium building the dam, said it had yet to receive the court's official notification and would carry on with construction.

"We are not against the government's project, but it cannot be a dictatorial process," federal judge Souza Prudente said.

Construction of the dam began a year ago amid criticisms from environmental groups and indigenous activists for its potential negative impact on the Amazon region, including deforestation and devastation of local communities. The project was scheduled to be completed by 2019.

If the dam is finished, some 500 square km of land along the region's Xingu River, a tributary of the Amazon, would be flooded, forcing out about 16,000 residents, according to official estimates.

Other agencies said the number would be up to 40,000. The government has promised to relocate the affected communities.

"Brazil Suspends Massive Amazon Dam Construction", 15/08/2012, online at: http://english.cri.cn/6966/2012/08/15/3241s717311.htm

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* Court suspends Amazon dam construction

A federal judge in Brazil has suspended construction work on a massive dam in the heart of the Amazon rainforest.

In a statement released on Tuesday, Judge Souza Prudente said that work could only resume on the \$11bn, 11,000MW Belo Monte Dam after the indigenous communities living in the area were consulted.

The dam has been condemned by environmentalists and rights activists, who say that it would devastate wildlife and the livelihoods of 40,000 people who live in the area that would be flooded.

The government, however, says the dam will be a source of clean, sustainable energy, and that it will help fuel the country's economy.

The dam would be the world's third largest when completed on the Xingu River that feeds the Amazon.

The court noted that when congress approved the project in 2005, it called for an environmental impact study after the start of the work.

Environmental impact

Native communities had been given the right to air their concerns in parliament on the basis of that environmental-impact study.

This was not done, the court said.

It said that the Norte Energia consortium in charge of the project will be able to appeal the decision to a higher court.

Norte Energia told AFP it was awaiting formal notification of the court ruling before responding.

The court said the consortium was liable for a daily fine of \$250,000 should it flout the order.

"It's a historic decision for the country and for the native communities," Antonia Melo, coordinator of the Xingu Vivo indigenous movement, said.

"It's a great victory which shows that Belo Monte is not a done deal. We are very happy and satisfied."

Fierce opposition

About 12,000 workers are due to be working on the dam's constructions, 24 hours a day, by the end of the year. Up to 22,000 are scheduled to be at the site by next year.



Work on the dam began a year ago, despite fierce opposition from local people and environmental activists.

Indigenous groups fear the dam will harm their way of life while environmentalists have warned of deforestation, greenhouse-gas emissions and irreparable damage to the ecosystem.

Belo Monte is expected to flood an area of 500sq km along the Xingu and displace 16,000 people, according to the government, although some non-governmental organisations (NGOs) put the number at 40,000 displaced.

Some 150 indigenous activists recently occupied one of the dam's four construction sites for three weeks to demand that Norte Energia honour commitments made to their communities.

The federal government plans to invest a total \$1.2bn to assist the displaced, by the time the dam is completed in 2019.

"Court suspends Amazon dam construction", 15/08/2012, online at:http://mwcnews.net/news/americas/20875-amazon-dam.html

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* Kuwait Lends Vietnam \$14.3 Million USD for Water, Agricultural Infrastructure

KUWAIT CITY, KUWAIT — The Kuwait Fund for Arab Economic Development (KFAED) on August 10 announced it had signed a \$14.3 million USD loan agreement with the Vietnamese government to improve water and agricultural infrastructure in 10 impoverished rural areas of Da Bac district, in northwestern Vietnam's Hoa Binh province.

The funds will be used to build four reservoirs of varying capacities; eight small dams, each capable of storing 5,000 cubic meters of water; 10 irrigation canals, with a total length of 18.6 kilometers; and four water collection units, KFAED Deputy Director Hisham al Waqian explained.

The project is expected to be completed by the end of 2016.

KFAED's loan has a 22-year term, with a five-year grace period and an interest rate of 2 percent.

According to al Waqian, it is the eleventh loan KFAED has extended to Vietnam.

The aid agency has lent a total of \$129.4 million USD to the Vietnamese government for development projects.

The majority of funds were directed to irrigation and agricultural development projects.

In 2001, KFAED funded a \$17 million USD irrigation project in Ayun, a \$14 million USD drainage improvement project in Van Dinh, and a \$21 million USD agricultural development project in Dau Tieng.

KFAED has been increasing its funding for irrigation and water projects in non-Arab countries.

Back in May, KFAED officials signed a \$25.5 million USD agreement with the Cuban government to fund drinking water and sanitation projects in the Cuban capital, Havana.

"Kuwait Lends Vietnam \$14.3 Million USD for Water, Agricultural Infrastructure", 15/08/2012, online at: <u>http://www.ooskanews.com/daily-water-briefing/kuwait-lends-vietnam-143-million-usd-water-agricultural-infrastructure_23869</u>

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✤ First sustainable waste management summit in Dubai

The first sustainable waste management summit to take place in the Middle East will be held in Dubai in November.

The Sustainable Waste Management Middle East Summit in Dubai, UAE will attract experts from the industry to discuss a range of topis such as waste policy, regulation, feedstock supply, project finance, commercial models and advanced waste-to-energy technologies.

Tracy Clark, managing director of the event's organiser, CWC Group, said: "By next year, nearly 50m people will live in the GCC's six member states. As many cities across the region see populations rapidly grow, effective waste management solutions are becoming an increasingly vital concern.

"It is essential for regional governments to implement sustainable waste management practices in order to safeguard economic development and protect the environment."

"First sustainable waste management summit in Dubai", 15/08/2012, online at: <u>http://www.constructionweekonline.com/article-18088-first-sustainable-waste-management-summit-in-dubai/</u>

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***** YEMEN: Time running out for solution to water crisis

SANA'A, 13 August 2012 (IRIN) - Under a staircase, clinging to a wall of Sana'a's Grand Mosque, groups of women and children lug plastic canisters to the leaky spigots of a public fountain. Some small children struggle with canisters nearly their size as they weave slowly between the fountain and the pushcarts used to wheel the water back home.

Whether in cities or villages, this is how millions of Yemenis secure their day's supply of water.

Since few can afford to pay for water to be pumped to their building, public urban fountains, which are free, remain the only option for most. Umm Husein, a resident of the capital Sana'a, said she has tap water only once or twice a week. Trips to the communal fountain - taking time out of work or studies - involve her whole family. "The women, the children, every day we go to the fountain to get water," she said.

Water and sanitation are chronic problems in Yemen, where, on average, each Yemeni only has access to about 140cu.m. of water per year for all uses. (The Middle East average is about 1,000cu.m. per person per year.) In recent years, the government of former President Ali Abdullah Saleh had taken strides to improve water access in Yemen, but the political turbulence that arose from last year's uprising has pushed water down the new government's list of priorities, according to aid workers and a government employee.

Changing priorities

Two years ago, Yemen's General Rural Water Authority (GRWA) commissioned a general assessment of existing water projects and coverage. The organizations that took part in the assessment came to a collective decision to focus on rainwater harvesting in Yemen's highlands, and on water drilling in the coastal and desert areas. Yet the ensuing political chaos put a halt to progress in implementing solutions, according to Abdulwali El Shami, an engineer in the government's Public Works Project (PWP) in Sana'a.



Beset with crises on various fronts, the new president, Abd Rabbu Mansoor Hadi, has put little energy towards resolving the water crisis threatening the majority of Yemenis. Indeed, Ghassan Madieh, a UNICEF water specialist in Sana'a, said he did not "see any serious attention being given to the issue of water scarcity, or the low coverage in water and sanitation."

Jerry Farrell, country director of Save the Children in Yemen, echoed this assessment: "[In June], the Ministry of Planning rolled out its plan for the next 20 months...and water was at the bottom of the list."

Though solutions exist, the will and attention necessary to put them into practice remain absent, observers say. Farrell said that without a greater governmental commitment to water issues, international aid organizations dealing with water will not be able to work effectively in the country. The government must also provide water subsidies for the extremely poor while water infrastructure is developed, he added.

A country run dry

The spectre of a country run dry looms over Yemen's nearly 25 million inhabitants.

With its streams and natural aquifers shallower every day, Sana'a itself risks becoming the first capital in the world to run out of a viable water supply. The water table in the city has dropped far beyond sustainable levels, El Shami said, because of an exploding population, lack of water resource management and, most of all, unregulated drilling. Where Sana'a's water table was 30 meters below the surface in the 1970s, he said, it has now dropped to 1,200 meters in some areas.

⁶⁶It will be very painful to the Yemeni people. They will have to make choices about survival, because water is life and water is survival.



The water supply in this largely arid country has been the source of decades-long ethnic conflicts, particularly among nomadic groups. In the northern governorate of Al-Jawf, a blood feud between two prominent local groups has continued unabated for nearly three decades, largely a result of the contested placement of a well on their territorial border.

Abdulwali El Jilani, a water specialist in Sana'a with the Community Livelihood Project, a programme to improve water access funded by the US Agency for International Development (USAID), warned that as water supply diminishes, tensions will only rise: "Water is and will be the reason for powerful conflicts in the future."

Lack of access to improved water supply has been responsible for the spread of water-borne diseases on a scale not witnessed in decades, according to UNICEF's Madieh. Dengue fever, diarrhea and cholera, for example, have spread at alarming rates in rural areas where access to clean water is limited. In 2011 alone, more than 30,000 Yemenis were suffering from acute watery diarrhea.

The vast majority of the water in Yemen - as much as 90 percent - goes to small-scale farming, at a time when agriculture contributes only 6 percent of GDP, according to Madieh. Though few precise statistics are available on the subject, Madieh said that 50 percent of all agricultural water goes to the <u>cultivation of khat</u>, a narcotic plant chewed by most Yemenis. As such, almost 45 percent of all water in Yemen is used to cultivate a plant that feeds no one, in a country where almost half of the population is food insecure.

While the water situation in many cities is dire, it is even more distressing in rural areas. According to the latest rural water survey by GRWA, completed this year, access to improved water supply - piped water, protected springs and wells - is limited to 34 percent of rural areas, compared to 70 percent of urban areas.

Village women spend most of each day trekking many kilometers along unpaved roads to reach the few wells that have not yet run dry. Many of them also collect water from streams polluted by waste, which they attempt to eliminate with rudimentary filtering systems.



Future steps

But Yemen is by no means devoid of strategies to improve water access. El Shami said that the PWP is building rainwater-harvesting tanks in rural areas so that villagers don't have to travel hours to collect water. These tanks are fitted with filtering systems, providing clean water in areas where it is hard to come by.

"We are trying as much as possible to go the natural way," El Shami said, referring to efforts not to drill or truck in water, common methods of obtaining water in areas particularly tight on the resource. "We don't want villagers to spend so much effort just to collect water."

El Jilani, the water specialist, said Yemeni activists are trying to create local awareness of the country's water emergency. Organizing regional workshops on water conservation techniques is one method activists hope will build local engagement on the issue. "There's a role to be played by citizens too," he noted, "in adopting a path to rebuild and improve water administration in their areas."

Yet experts agree that if Yemen's leadership doesn't take meaningful action soon, the consequences will be devastating.

"In 10 years' time, we will have only surgical solutions left," Madieh said. "It will be very painful to the Yemeni people. They will have to make choices about survival, because water is life and water is survival."

"YEMEN: Time running out for solution to water crisis", 13/08/2012, online at: http://www.irinnews.org/Report/96093/YEMEN-Time-running-out-for-solution-to-water-crisis

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* Once fertile, Yemen now faces severe food scarcity

A cramped room in Yemen's capital which has been partitioned into two sections is home to Mohamed al-Tihami and his family of six.

The 37-year-old plumber, like many in the impoverished country, is struggling to make ends meet. "I hardly manage to cover my family needs between the rapid price rises and the few work opportunities," al-Tihami said.

Despite his spartan living conditions, al-Tihami laments that half his income is spent on rent.

"I barely make 35,000 riyals (\$160) a month, sometimes less than that, and it goes to nothing other than my family's essential requirements and home rent," he said.

Yemen was once known to the Romans as Arabia Felix - "Happy Arabia" - thanks to its fertile land that contrasted with the peninsula's northern desert.

Today, the country's 23mn people are suffering from poverty and food shortages.

A recent UN World Food Programme report said that 45% of the population is suffering from "food insecurity", which is defined as difficulty finding, or affording, adequate food.

Among these, 22%, or almost 5mn people, are classified as severely food insecure - a figure that has almost doubled since 2009, according to the report.

"Yemen is suffering from a serious economic meltdown that marks it as one of the 10 most foodinsecure countries with the highest poverty rates in the world," said Mustafa Nasr, the head of

Yemen's Studies and Economic Media Centre, a non-governmental group.

A number of factors have combined to push the country to the brink.

It is using up its limited water resources faster than they can be replenished. Fuel price increases add to the cost of food brought from outside the immediate area.

The rising food prices have had a major impact on a country that is heavily dependent on imports, while inflation has hit purchasing power.

The situation was aggravated by last year's political crisis, which led to a split in the army between supporters and opponents of then-president Ali Abdullah Saleh.

Widespread violence and a collapse in security ensued.

Although Saleh stepped down and his deputy Abd-Rabbu Mansour Hadi took office in February following a single-candidate presidential election, the new leader is still grappling with his predecessor's legacy.



The UN estimates the country has 545,000 internal refugees, including many from the province of Saada in the north, where government forces have been fighting an eight-year war with the Houthi, a Shia Muslim rebel group.

Workers in Yemen's private sector have been among those feeling the fallout from the turmoil of the last two years.

"I was working in tourism for many years, as a guide with a prominent tourism agency," said Saleem Abdul-Qadir, who is in his late 20s. "It used to be my main source of income."

He added: "I was dismissed from my work because the tourism sector was completely paralysed and my employer was unable to pay our salaries."

One-third of Yemeni households have gone into debt simply in order to buy food. Among the severely food insecure, 35% of household expenditure goes to staple foods alone, such as bread and rice.

The World Food Programme warns of grave consequences if the situation continues.

"In the current situation where families are trapped in extreme vulnerability, any new shock no matter how minor could easily push millions over the edge," it said.

"Once fertile, Yemen now faces severe food scarcity", 19/08/2012, online at: <u>http://www.gulf-times.com/site/topics/article.asp?cu_no=2&item_no=526113&version=1&template_id=37&parent_id=17</u>

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* The Situation of Water Resources in Kyrgyzstan

In recent years, the population increases at the rate of more than twice in Central Asia. Day by day, governments need water resources more due to requirements of drinking, irrigation and also energy. And as a result, a water problem is experienced between states in Central Asia. Kyrgyzstan is rich in water resources like Tajikistan, but she is a poor country in terms of some resources such as oil, gas and coal.

Kyrgyzstan is rich country in the way of both surface waters and ground waters. Water is stored in rivers, glaciers and snow- banks. According to FAO data, average annual amount of water is 2,458 km³, 50 km³ of this figure is surface water and 13 km³ is groundwater. Besides, 1,745 km³ of water is stored in lakes and 650 km³ in glaciers. 8,208 large and small glacier mountains are located in the territory of Kyrgyzstan and 4, 2 percent of country's surface area is ice.

Usually, glaciers are located in east Sary-Jaz river basin, the amount of fresh water stored in mountain glaciers is 650 km³. This figure is 12 times of the amount of flowing water in rivers in the country. Reductions occur in glacial areas owing to the impact of global climate change. According to the estimates, in Kyrgyzstan it has been calculated that at rate of 30-40 percent of shrinking will occur at the size of glacier areas. Consequently, there will be a decrease in the rate of 25-35 percent of the water resources. Except from the glaciers, another water resource of Kyrgyzstan is the lakes. Totally, there are 1923 lakes and the total surface area of these lakes is 6836 km². Issik lake (6236 km²), Son-Kul (275 km²), Chatry-Kul (175 km²) are some of the lakes. 84 percent of the lakes is located in 3000 -4000 altitude, a tectonic origin area. The longest river of Kyrgyzstan is Naryn River (535 km), Chatkar Lake (205 km), and Chu River is 221 km. Talas River has 5, 83 km³ and Assaa River has 2 km³ flows. More than 3500 rivers flow within the country frontiers and in neighboring countries (Kazakhstan, Uzbekistan, Tajikistan, China, and Xinjiang – Uyghur region). Moreover, 0, 52 percent of country's surface area is marsh. There are 13 reservoirs with a capacity of 23, 41 km³ in the country.

While 24 percent of 50 billion m³surface water is used in the country, 23 percent of recycling water gets lost during usage. Irrigation and water distribution systems have inadequate technical conditions



and this is the reason for this situation. The aging installment, inefficient irrigation methods and the lack of water saving technologies increase water loss. Most of the water resources are used for the purpose of irrigation as the worldwide, while the amount of water used for irrigation is at the rate of 88 percent, drinking and industrial water supply has a ration of 12 percent.

When we look at countries' quantities of water per capita in the region, the amount of water which is only used for drinking and domestic usage is per capita is Kazakhstan 6919 m³/year, Kyrgyzstan 4379 m³ /year, Tajikistan 2356 m³/year, Turkmenistan 4964 m³/year, Uzbekistan 1858 m³/year according to 2010 and FAO figures.

If the numbers above are analyzed, the country which has the least resource in terms of water resources is Uzbekistan. Since Kyrgyzstan and Tajikistan aren't rich in oil, gas and coal resources, high dams and hydroelectric power plants on water resources establish energy production. Other riparian countries are concerned about Kambarata Dam I and II. Especially Uzbekistan has concerns about impacts of large dams, which were built and will be built in Kyrgyzstan and Tajikistan, effects on cotton production. Actually, large dams protect down riparian countries and regulate flows in their floods period.

Transboundary waters in the region cause tension in the relations between the countries. In 1997, Uzbek army has stacked the military on the border of the dam reservoir. In 1998, Uzbekistan has stopped to give gas to both Tajikistan and Kyrgyzstan because of water. In 2008 150 Tajik citizens have entered into the dam that is located on the border, and tried to harm. This dam has been chosen because Kyrgyzstan leaves water to Tajikistan via this dam. In fact, the region has a significant amount of water but water shortages are increasing in line with the growing needs of the countries day by day.

This summer, also in Kyrgyzstan difficulties are experienced in terms of water resources. Kyrgyzstan which imports electricity to neighbor countries, imports 1 billion kilowatt-hours less electricity from Kazakhstan this term. Toktogul Dam is located on the Naryn river which reservoir has 19, 5 billion cubic meters capacity in total. For the last records, there are 17, 7 billion cubic meters; this figure is 2, 2 billion cubic meters less than last year's figure. As of June 30, Kyrgyzstan has imported 877



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billion kilowatt-hours electricity in total, this figure is 59 percent of the figure that was imported in last year this time. 645 billion kilowatt-hours of this figure which is in question is the part of imported to Kazakhstan. The company operated by government and named Electric Station of Kyrgyzstan has made the electricity price reduction agreement with seven Kazakhstan company and identified the price as 2, 8 cent per 1 kilowatt-hour.

"The Situation of Water Resources in Kyrgyzstan", Tuğba Evrim Maden, ORSAM, 10/08/2012, online at: <u>http://www.orsam.org.tr/en/WaterResources/showAnalysisAgenda.aspx?ID=1856</u>

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