

# ORSAM WATER BULLETIN

Weekly Bulletin by ORSAM Water Research Programme

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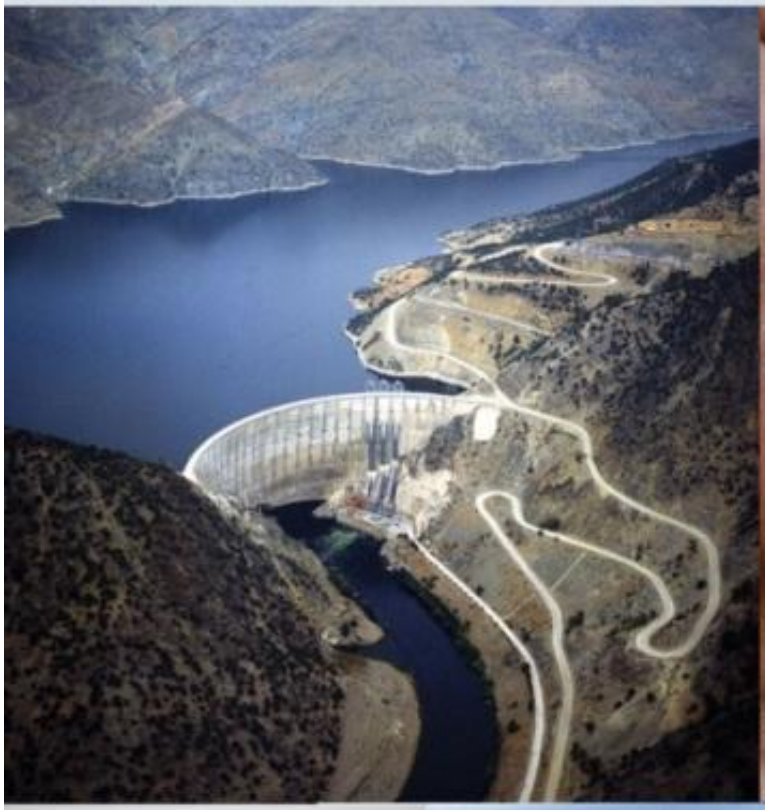



Issue 193

# ORSAM WATER BULLETIN

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## ❖ Turkey deals with Iraq, not with ISIS, Says Energy Minister

**ANKARA —** Turkey doesn't take ISIS threats concerning the Ataturk dam seriously, said Turkish energy minister on Monday in Ankara, responding to a warning issued by the ISIS that they would invade Istanbul should Turkey continue to hold water in the Euphrates river in southeastern Turkey via the Ataturk dam.

In the first part of a five-episode documentary about the ISIS - formerly known as Islamic State of Iraq and Al-Sham or ISIS - published on Saturday by Vicenews - an international news website - a spokesman, Abu Musad, openly threatens of invading Istanbul if Turkey doesn't open the Ataturk dam and allow water to flow downstream in order to reach ISIS-controlled areas in Iraq.

He tells the correspondent: "If they do not consider it now, we will consider it for them by liberating Istanbul."

Turkish Energy Minister Taner Yildiz replied: "Turkey makes its own decisions about energy policy. I do not take it seriously as Turkey sees Baghdad as the partner to negotiate with."

He added that Ataturk dam currently produces 1200 megawatts of electricity. The dam sits on the Euphrates river and was built in 1990.

Armed groups linked to the ISIS captured the regions of Sinjar and Rabia in the northern Nineveh province of Iraq last week following fierce clashes that forced thousands of Iraqis including Turkmen, Arabs and Ezidis to flee.

The violence in Iraq escalated in early June after a coalition of armed groups linked to the ISIS took control of large swathes of the country's predominantly Sunni provinces.

ISIS militants also seized 49 Turkish consulate staff, including the consul-general and family

members, in the Iraqi city of Mosul. Moreover, 31 Turkish truck drivers were also abducted in early June.

"Turkey deals with Iraq, not with ISIS, Says Energy Minister", 11/08/2014, online at: http://www.dailysabah.com/politics/2014/08/11/turkey-doesnt-take-isis-threats-seriously-says-energy-minister

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### ❖ Turkey brushes off ISIL threat to 'liberate' Istanbul

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"Turkey brushes off ISIL threat to 'liberate' Istanbul", 12/08/2014, online at: http://www.worldbulletin.net/todays-news/142337/turkey-brushes-off-isil-threat-to-liberate-istanbul

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## ❖ Islamic State Threatens Turkey Over Euphrates River Water

The Islamic State (IS) group, formerly known as ISIS or ISIL, said this week that if Turkey does not allow more water to flow through its dams on the Euphrates River, militants will do it themselves by "liberating" Istanbul.

"I pray to God that the apostate [Turkish] government reconsiders its decisions. Because if they do not reconsider it now, we will reconsider it for them by liberating Istanbul," IS spokesman Abu Mosa said in a videotaped message.

IS has seized territory in Syria and Iraq over the past few moths, including key hydropower dams and reservoirs.

Starting in June, the militant Islamist group began accusing Turkey of stopping water flows out of its dams, which in turn decreased the water levels in northern Syria's Lake Assad -- a major water source for the country and now for IS, which established its "capital" nearby at Raqqa.

Measurements of the river's flow at the Syrian border showed that Turkey released more than the minimum 500 cubic meters per second in April, and that this amount did drop to 222 cubic meters per second in May.

However, this decrease is not considered enough to account for the total drop in Lake Assad's levels, according to experts.

Last month, Waleed Zayat, a mechanical engineer working for the Syrian opposition's interim government in Aleppo, where Lake Assad is located, blamed the decrease in water levels on a drastic increase in electricity generation at the Euphrates Dam at Al Tabqa.

He said the Syrian government had decided 10 years ago to stop using the dam for power generation, and to use it only as a strategic water reservoir. He said that normally, only one or two of the turbines at the dam are used, and only for a few hours a say. But since IS took over, all eight turbines have been running at full capacity, he said.

"Islamic State Threatens Turkey Over Euphrates River Water", 13/08/2014, online at:
https://www.ooskanews.com/story/2014/08/islamic-state-threatens-turkey-over-euphrates-river-water_161769

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### ❖ Why Iraq Is So Desperate to Retake Mosul Dam from ISIS

*The militants could put a chokehold on millions of Iraqis' water supply — or destroy the dam and cause deadly, widespread flooding*

When Saddam Hussein built the Mosul dam three decades ago it was meant to serve as a symbol of the strength of Iraq and his leadership. He was following a tradition of big, but often ill-considered infrastructure projects in some Middle East dictatorships that seem more like a muscle-flex by a country's leader than a project for the people.

Now that dam — the country's biggest, holding back 11 billion cubic meters of water and producing over 1,000 megawatts of electricity — is at the center of a military struggle between Iraqi and Kurdish forces backed by the U.S. and the Islamic State of Iraq and Greater Syria (ISIS), which took control of the structure on Aug. 7.

Kurdish forces retook part of the dam early Sunday, the Associated Press reported, aided by U.S. and Iraqi air strikes. The Americans brought along some serious hardware to the fight; a combination of bombers, fighter jets, attack planes and unmanned drones, according to U.S. Central Command, conducted 14 strikes on Sunday and nine the day before. The show of force proves that the threat posed by ISIS control of the dam is finally being taken seriously.

"We told the Iraqi government a month ago that we needed to protect this strategic structure," said Shirouk al-Abayachi, a member of the Iraq parliament for the Civil Democratic Alliance, and previously an adviser to the Ministry of Water Resources. "Any group manipulating this dam away from its original purpose is dangerous."

Control of the dam gives ISIS the ability to do exactly that, and the consequences could be devastating. The group has several ways to leverage its control of the dam, say experts. "One of the things Saddam Hussein was really good at in his reign was choking off water supplies to Shi'ites in the south," said Christopher Harmer, who is a senior analyst with the Institute for the Study of War, and who served several stints with the U.S. army in Iraq. "ISIS now controls the water flowing into Baghdad and to the agrarian areas south of Baghdad. They are in a position to impose a famine on the rest of Iraq."

Alternatively, the militants could destroy the dam, sending a 60-ft. wave ripping down the Tigris River, washing away Mosul, a city of 1.5 million people, and days later flooding Baghdad with meters of water. ISIS is unlikely to do that while Mosul remains under its control. But it means that Iraqi forces must take control of the dam, said Harmer, before making a move on Mosul.

But even with U.S. military help, retaking the large piece of infrastructure will not be easy. The ISIS militant army, which a year ago seemed like a relatively small extremist faction in Syria, now controls swaths of territory both there and here in Iraq, as well as shored-up weapons and influence.

The fear now is that with control of water and electricity, the dream of creating a caliphate — or an Islamic state — is becoming closer to a reality for the extremists, famed for enforcement of strict Islamic law, beheadings and massacres.

"Al-Qaeda has always been just a terrorist organization," said Harmer. ISIS broke off from al-Qaeda last year and has since promoted itself as the premier jihadist organization. "Al-Qaeda kind of, sort of, talked about establishing a caliphate sometime in the future, but they never had any stated ambition of taking over a state. ISIS is showing a differing level of ambition. ISIS has said, We are going to run a state and therefore we are going to provide all of the state services."

Even if ISIS doesn't use Iraq's biggest dam as a weapon, its fragile condition means it still poses an enormous threat while in the militants' hands. In September 2006, the U.S. Army Corps of Engineers described it as "the most dangerous dam in the world." The dam is built on an unstable bed of sand, slit and clay and requires daily grouting just to hold back the water.

"Iraq alone cannot deal with this. The Mosul dam is in a critical situation with ISIS in control," said al-Abayachi. Just weeks of neglect could see the dam burst sending flood waters that could leave hundreds of thousands of Iraqis dead in its path. "We need help from the international community."

"Why Iraq Is So Desperate to Retake Mosul Dam From ISIS",19/08/2014, online at: https://time.com/3126423/iraq-isis-mosul-dam-airstrikes/

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### ❖ A tale of two dams: Catastrophes in the making

This is a tale of two hydroelectric dams. Two dams far from each other, either of which could produce the next great humanitarian crisis.

The first is the Mosul Dam, which stretches across the Tigris River in a valley north of Mosul, Iraq. As dams go, this one is a civil-engineering horror. It has been captured by the Islamic State, also known as the Islamic State of Iraq and the Levant.

Should the two-mile-wide dam fail, which is likely, Mosul will be wiped out and the damage will extend to Baghdad. Loss of life could reach 500,000, and millions could be deprived of water and power. An immense catastrophe piled on the daily pain of Iraq.

The second dam, far away in Southern Africa on the Zambezi River, is the Kariba. This 55-year-old dam, by some measures, is the world's second-largest. It was a civil-engineering masterpiece and has held up well, given the spotty maintenance by its owners – Zambia, on the north bank and Zimbabwe, on the south bank.

If the Kariba Dam fails, as it is predicted to do in three years without repairs, surging water would rip a vast trench down the length of the Zambezi River on its route to the Indian Ocean. The wall of water would take out another giant dam, Cahora Bassa, in Mozambique. Loss of life could reach 3.5 million, with untold damage to wildlife. Central Southern Africa would lose 40 percent of its electric supply.

While the Mosul and Kariba dams are linked in their potential lethality, they are very different structures.

The Mosul Dam was a rush job, ordered by Saddam Hussein in the 1980s without regard to the engineering realities on the site. It is anchored in gypsum, which dissolves in water. So daily, leaks in the foundation have to be plugged with "grout," a mixture of cement and sand. The U.S. Army Corps of Engineers said the Mosul Dam is fundamentally the wrong structure for the location, and called it the "most dangerous dam in the world."

Even with careful tending, the Mosul Dam is in danger. According to a report in The Wall Street Journal, many of the workers who have kept the dam going fled when the Islamic State arrived, and only one dedicated manager is known to have remained.

The United States spent $33 million trying to stabilize the Mosul Dam, but the money, according an inspector general's report, was largely wasted. Now the United States cannot bomb near the dam for fear of destabilizing it further.

Apart from general-maintenance issues, the Kariba Dam issues are a little simpler. When the dam was built between 1955 and 1959, it was planned that the river flow would be controlled though six sluice gates set in the wall. These empty into a plunge pool, before the water flows downstream.

The trouble is the plunge pool has grown from an indentation in the riverbed to a vast crater 285 feet deep. There the water swirls around with great force and is eroding the basalt rock on which the dam is anchored. The dam is eating itself alive. All the sluice gates dare not be opened at once, and have not been since 1966.

The fix is a mixture of blasting the plunge pool, so the water goes downstream without creating a whirlpool, and injecting grout – in the form of underwater concrete – to shore up the foundation.

A consortium of the World Bank, the European Union and the African Development Bank this month agreed to provide $250 million to save Kariba. Engineers say the work must be done in the next three years or it will be too late.

If Zimbabwe and Zambia can agree on the contracts and let them in time, work should begin next year. But in that part of the world, the only thing that moves fast is the Zambezi River.

The future of Mosul Dam is anyone's guess.

"A tale of two dams: Catastrophes in the making",14/08/2014, online at: http://www.thenewstribune.com/2014/08/14/3331057/a-tale-of-two-dams-catastrophes.html?sp=/99/447/

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### ❖ Kurds fight to retake Mosul dam

Kurdish forces supported by US air strikes are battling to retake Mosul dam from Islamic State (IS) fighters in northern Iraq.

The operation to recapture the country's largest dam began early on Saturday with raids by F-18 fighters and drones, US officials said.

Kurdish Peshmerga fighters have shelled militants' positions, and there is an unconfirmed report of a ground attack.

At least 11 IS fighters have been killed, the BBC reports.

The extreme Sunni group, which overran Mosul this summer, has been accused of a new massacre of non-Muslims.

At least 80 men from the Yazidi faith were killed, and scores of women and children abducted, in the village of Kawju on Friday.

Reports say the men were killed after refusing to convert to Islam. A US drone strike later destroyed two vehicles belonging to the militants.

Reports on Saturday morning said US aircraft had launched strikes on IS positions near the strategic dam in Mosul.

US military officials said the decision to try to retake the dam came after intelligence showed the militants were not yet at a point where they destroy the dam.

Kurdish commander Major General Abdelrahman Korini said the Peshmerga had captured the eastern side of the dam and were "still advancing".

Rudaw, a Kurdish news website, said the air strikes appeared to be the "heaviest US bombing of militant positions since the start of air strikes" against IS last week.

The dam, captured by IS on 7 August, is of huge strategic significance in terms of water and power resources.

Located on the River Tigris about 50km upstream from the city of Mosul, it controls the water and power supply to a large surrounding area in northern Iraq.

The BBC reports that the there are fears the dam is structurally dubious and many have warned that it could unleash a catastrophic flood if it was breached.

"Kurds fight to retake Mosul dam",17/08/2014, online at: http://www.radionz.co.nz/news/world/252309/kurds-fight-to-retake-mosul-dam

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## ❖ Iraq's Most Dangerous Dam Still Operating, Under ISIS Control

Employees at the Mosul Dam in Iraq, which is under the control of a brutal group of Islamist fighters, are still producing electricity and carrying out vital daily grouting operations, temporarily mitigating fears of a breach that could launch a 65-foot wall of water into the country's largest cities and send flood waters all the way to **Baghdad**.

The lead dam engineer and his team, along with their families, are still on site and continuing to operate the country's largest dam, an **Iraqi government** official told ABC News. Though communications with the engineers have been difficult, the Iraqi Ministry of Water Resources is still in contact with the operating team.

The level of the water at the dam is being kept lower than normal in order to reduce the threat of a breach, even after taking into account evaporation from summer heat, officials said.

The extremist group the Islamic State, or ISIS, released a video this week on **YouTube** showing its black banner flying above the dam. It wrested control of the dam away from the well-respected Kurdish Peshmerga troops last week, raising concerns among American officials.

"We are extremely concerned by this development," State Department spokesman Michael Lavallee told ABC News at the time, "and we are coordinating with the **Iraqi security forces** and Kurdish Peshmerga commanders to develop options to mitigate the threat that this poses."

Concerns remain about continued access to cement needed for the grouting process, but Iraqi government officials told ABC News that there should be three months-worth of cement stockpiles left on site.

Since ISIS took control of the dam and started closing in on Erbil, the capital of the Kurdish autonomous region where some American diplomats and military advisers are stationed, the United States military launched air strikes against the militants in support of Iraqi and Kurdish forces. The U.S. also air dropped relief aid to thousands of stranded members of the Yazidi minority who had fled ISIS persecution and sought refuge in the surrounding, arid mountains of Sinjar.

The threat posed by ISIS' control over the dam is a severe one, according to U.S. government reports, U.S. officials and outside experts.

The Mosul Dam was constructed in the mid-1980s on what reports indicate was a terrible spot to build a two-mile-wide dam.

"Mosul Dam, the largest dam in Iraq, was constructed on a foundation of soluble soils that are continuously dissolving, resulting in the formation of cavities and voids underground that place the dam at risk for failure," said an urgent letter sent from **David Petraeus**, then commanding general of the U.S. Army, and **Ryan Crocker**, then U.S. Ambassador to Iraq, to Iraqi Prime Minister **Nouri al-Maliki** in 2007.

The dam requires "extraordinary engineering measures" -- namely constant grouting operations -- to fill in the holes and "maintain the structural integrity and operating capability of the dam," according to a U.S. **Army Corps of Engineers** (USACE) report from the same year.

For 30 years –- and through several periods of violent conflict -- the Iraqi government has managed to keep the dam upright by continuously pumping in literally tons of grout like an industrial version of the little Dutch boy, as a geotechnical expert who worked on the dam put it.

But the U.S. says any failure of the dam could be "catastrophic."

"[T]he most severe impact of a dam failure would be [for] the City of Mosul, located 50 kilometers [31 miles] downstream of the dam," Petraeus' and Crocker's 2007 letter said. "Assuming a worse [sic] case scenario, an instantaneous failure of Mosul Dam filled to its maximum operating level could result in a flood wave over 20 meters [65 feet] deep at the city of Mosul, which would result in a significant loss of life and property."

Mosul is estimated to be home to more than 1.5 million people. Flood waters, albeit at a lower level, could reach all the way to Baghdad, more than 200 miles further down the Tigris, depending on the performance of another smaller dam further downriver.

A 2011 report written by a USACE official and published in Water Power magazine estimated failure "could lead to as many as 500,000 civilian deaths."

State Department spokesperson Jen Psaki told reporters last week that the Mosul Dam "has been in the sights of [ISIS] since its offensive began in June to further threaten and terrorize the **Iraqi people**."

In addition to flooding concerns, the dam is also a "key source" of power and water for the surrounding area -- making it a vital piece of infrastructure either way, another State Department official told ABC News last week. An American intelligence source agreed and said that ISIS's potential control over and exploitation of power and water is a focus of U.S. intelligence community.

So far though, Iraqi officials tell ABC News the workers at the dam have been able to pump water and produce electricity from one of two hydro-electric plants on site.

Prior to the ISIS takeover, a U.S. government official long-familiar with the dam said the possibility of the Iraqi government losing control of the structure was a scary one. ISIS may not want the dam to fail, considering it controls territory that would be flooded and the group could leverage its control over the water and power source, but the U.S. official said it would still be up to the jihadist group to keep the grouting going.

"Iraq's Most Dangerous Dam Still Operating, Under ISIS Control",15/08/2014, online at: http://abcnews.go.com/Blotter/iraqs-dangerous-dam-operating-isis-control/story?id=24988310

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### ❖ Militants grab new weapon - Iraqi wheat

**BAGHDAD**: AFTER seizing five oil fields and Iraq's biggest dam, Sunni militants bent on creating an Islamic empire in the Middle East now control another powerful economic weapon – wheat supplies.

Fighters from the Islamic State, formerly known as ISIL, have overrun large areas in five of Iraq's most fertile provinces, where the United Nations food agency says about 40 per cent of its wheat is grown.

Now they're helping themselves to grain stored in government silos, milling it and distributing the flour on the local market, an Iraqi official said. The Islamic State has even tried to sell smuggled wheat back to the government to finance a war effort marked by extreme violence and brutality.

Meanwhile, Iraqi Prime Minister Nouri al-Maliki said he would press ahead in the Iraqi courts with his increasingly unlikely bid to retain power and would not turn to the army.

With so many political forces now aligned against Mr Maliki, including the United States and Iran, and with his retreat from veiled threats to use force, the intensity of the political crisis that has gripped Baghdad in recent days has diminished.

In his weekly speech, Mr Maliki said he was refusing to step aside because "we are defending the right of those who have voted" in the country's general election in April – in which his Shiite-led bloc won the most seats, though not a majority, in parliament.

Mr Maliki has argued that he has the right to be asked first by President Fouad Massoum to try to form a new government, and that Mr Massoum acted unconstitutionally when he nominated Haider al-Abadi, another Shiite politician, instead.

While Iraq faces no immediate food shortages due to the Islamic State's commandeering of wheat supplies, the longer-term outlook is deeply uncertain.

Hassan Nusayif al-Tamimi, head of an independent nationwide union of farmers' co-operatives, said the militants were intimidating any producers who tried to resist.

"They are destroying crops and produce, and this is creating friction with the farmers. They are placing farmers under a lot of pressure so that they can take their grain," he said.

Many farmers have joined the hundreds of thousands of Iraqis who have fled the militants' advance. Those who remain have yet to be paid for the last crop, meaning they have no money to buy seed, fuel and fertilisers to plant the next.

It is unclear how much wheat has fallen into rebel hands, as the government still controls parts of the provinces. However, a source at the Agriculture Ministry said about 30 per cent of Iraq's entire farm production, including the wheat crop, is at risk.

A senior Iraqi government official said militants had seized wheat in recent weeks from government silos in the provinces of Nineveh and Anbar, which both border Syria. These included 40,000-50,000 tonnes taken in Tal Afar and another Nineveh town, Sinjar, where tens of thousands of local people from the Yazidi religious minority have fled the militant onslaught to a nearby mountain range.

Islamic State insurgents have also seized several towns and villages from rival Islamist groups in Syria, an organisation monitoring the war in Syria said on Wednesday.

Already in control of large areas of northern and eastern Syria, Islamic State's latest gains include the towns of Turkmen Bareh and Akhtarin, 50 kilometres north-east of Aleppo, the Syrian Observatory for Human Rights, which is based in Britain, reported

"Militants grab new weapon - Iraqi wheat",15/08/2014, online at:
http://www.stockandland.com.au/news/agriculture/cropping/general-news/militants-grab-new-weapon-iraqi-wheat/2708674.aspx

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### ❖ US, Iraq, Kurds team up to retake Mosul Dam from ISIS

The creation of a new Iraqi government without Nouri al-Maliki may have already begun paying off in more muscular assistance to Baghdad as ISIS continues its sweep through the northern part of the country. The US has begun coordinating air strikes with a new offensive by Iraqi and Kurdish forces to retake control of the Mosul Dam, whose collapse could kill as many as a half-million people. The dam could play a critical role for ISIS for extortion purposes and the loss of it could cripple central Iraq, which relies on power generated from the problem-plagued dam:

U.S. warplanes carried out airstrikes in northern Iraq near ISIS-controlled Mosul Dam early Saturday morning, the Kurdish news agency Rudaw reported, citing eyewitnesses.

CNN confirmed that a U.S. and Iraqi military operation aimed at retaking the country's largest hydroelectric dam from the so-called Islamic State was scheduled to begin early Saturday morning (Friday at 6 p.m. ET).

The operation was to begin with U.S. and Iraqi airstrikes against ISIS positions, with Iraqi and Kurdish Peshmerga forces following up on the ground.

U.S. fighter jets began carrying out the strikes early Saturday morning local time, Rudaw reported.

The loss of control of the dam created a high degree of concern in Baghdad as well as with its Western allies. Not only does the dam provide power to central Iraq, it's also a critical part of the fresh-water infrastructure in the region. The dam itself is fragile even when the political situation is stable; the government in Iraq had planned to partner with the US and others to fix it before it collapsed on its own before ISIS pushed them out of the region. Its destruction — natural or otherwise — would be catastrophic for millions of people in Iraq.

NBC News spoke with Iraqi and Kurdish forces working together on the new offensive. They understand the need to work together, but when asked whether they can beat ISIS, the best they can say is*insh'allah*:

ISIS, meanwhile, has not stopped its offensive even with the US conducting airstrikes on their position. They sacked a village near Sinjar, massacring 80 or more Yazidi men and seizing over 100 women to send into slavery. The town of Kojo had been under siege for days, and finally fell yesterday. CNN notes that the reports of massacring men and sexual slavery for women is consistent with reports from similar ISIS actions in the area:

This is a campaign of annihilation against the Yazidis, and also the Christians and even Muslims who profess any heterodoxy from ISIS' extreme ideology. The UN issued sanctions against a half-dozen of ISIS' financiers and warned that the same will follow for anyone supplying weapons to the group:

The United Nations Security Council took aim at Islamist militants in Iraq and Syria on Friday, blacklisting six people including the Islamic State spokesman and threatening sanctions against those who finance, recruit or supply weapons to the insurgents.

The 15-member council unanimously adopted a resolution that aims to weaken the Islamic State – an al Qaeda splinter group that has seized swaths of territory in Iraq and Syria and declared a caliphate – and al Qaeda's Syrian wing Nusra Front.

Islamic State has long been blacklisted by the Security Council, while Nusra Front was added earlier this year. Both groups are designated under the U.N. al Qaeda sanctions regime.

Friday's resolution named six people who will be subject to an international travel ban, asset freeze and arms embargo, including Islamic State spokesman Abu Muhammad al-Adnani, an Iraqi described by U.N. experts as one of the group's "most influential emirs" and close to its leader Abu Bakr al Baghdadi.

The UN seems a bit slow to react to the crisis, which has been unfolding all year. While these sanctions are certainly welcome, they won't do much to deflect the current trajectory of the group. They have all the arms they need for a while, thanks to the collapse of the Iraqi military, and it won't be long before they can sell oil on the black market to get their own financing. This seems too little, too late to stop ISIS, and it's telling that the UN can't seem to bring itself to discuss what actually *could* stop ISIS — which is a multilateral force that will roll back ISIS and take control on the ground, denying them the opportunity to commit their genocides. Without that even on the table,

ISIS has little to worry about in the near term, even if they do lose control temporarily of the Mosul Dam.

" US, Iraq, Kurds team up to retake Mosul Dam from ISIS",16/08/2014, online at: http://hotair.com/archives/2014/08/16/us-iraq-kurds-team-up-to-retake-mosul-dam-from-isis/

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## ❖ Mosul Dam: Why the battle for water matters in Iraq

**Whoever controls the Mosul Dam, the largest in Iraq, controls most of the country's water and power resource.**

When Saddam Hussein built the dam three decades ago, it was meant to serve as a symbol of his leadership and Iraq's strength.

The dam is the latest key strategic battleground in northern Iraq between militants from Islamic State (IS), who took it on 7 August, and Kurdish and Iraqi forces supported by American airpower.

Located on the River Tigris about 50km (30 miles) upstream from the city of Mosul, the dam controls the water and power supply to a large surrounding area in northern Iraq.

Its generators can produce 1010 megawatts of electricity, according to the website of the Iraqi State Commission for Dams and Reservoirs.

The structure also holds back over 12 billion cubic metres of water that are crucial for irrigation in the farming areas of Iraq's western Nineveh province.

**Instrument of war**

However, since its completion in the 1980s, the dam has required regular maintenance involving injections of cement on areas of leakage.

The US government has invested more than $30m (£17.9m) on monitoring and repairs, working together with Iraqi teams.

In 2007, the then commanding general of US forces in Iraq, David Petraeus, and the then US ambassador to Iraq, Ryan Crocker, warned Iraq's PM Nouri Maliki that the structure was highly dangerous because it was built on unstable soil foundation.

"A catastrophic failure of Mosul dam would result in flooding along the Tigris river all the way to Baghdad," they said in a letter.

"Assuming a worst-case scenario, an instantaneous failure of Mosul dam filled to its maximum operating level could result in a flood wave 20 metres (65.5ft) deep at the city of Mosul," it said.

Writing to Congress, President Obama cited the potentially massive loss of civilian life and the possible threat to the US embassy in Baghdad.

Those dangers, he wrote, were sufficient reasons for deploying air power to support Kurdish forces trying to recapture the dam.

**'Method in their madness'**

Relief in Washington and Baghdad will only come when IS militants, who have sought control of water resources before, have been stopped from using the dam as an instrument of war.

The deployment of air power by the US in support of Kurdish forces has shown how seriously the White House takes the potential threat posed by IS control of the dam.

The Fallujah dam, in the Nuamiyah area of the city, in Iraq's western Anbar province, fell under IS control in February.

However, the group has so far failed in its attempts to capture the Haditha dam, Iraq's second largest, from the army.

The 8km-long Haditha dam and its hydro-electrical facility, located to the north-west of Baghdad, supply 30% of Iraq's electricity. Securing it was one of the first objectives of US special forces invading Iraq in 2003.

With the Mosul dam in its hands, the concern is that Islamic State could "flood farmland and disrupt drinking water supplies, like it did with a smaller dam near Fallujah this spring," wrote Keith Johnson in an article for Foreign Policy last month.

In May, a flood displaced an estimated 40,000 people between Fallujah and Abu Ghraib.

Earlier this month, IS militants reportedly closed eight of the Fallujah dam's 10 lock gates that control the river flow, flooding land up the Euphrates river and reducing water levels in Iraq's southern provinces, through which the river passes.

Many families were forced from their homes and troops were prevented from deploying, Iraqi security officials said.

Reports say the militants have now re-opened five of the dam's gates to relieve some pressure, fearing their strategy might backfire if their stronghold of Fallujah flooded.

In the days after they took over the Mosul dam, militants were reportedly blackmailing frightened workers to either keep the facility going or lose their pay.

Analysts fear the Islamic State could now use the dam as leverage against the new Iraqi Prime Minister Haider al-Abadi, by holding on to the territory around it in return for continued water and power supply.

The group already controls other key national assets - several oil and gas fields in western Iraq and Syria.

"These extremists are not just mad," says Salman Shaikh, director of the Brookings Institution's Doha Centre in Qatar.

"There's a method in their madness. They've managed to amass cash and natural resources, both oil and water, the two most important things. And of course, they're going to use those as a way of continuing to grow and strengthen."

"Mosul Dam: Why the battle for water matters in Iraq",17/08/2014, online at: http://www.bbc.com/news/world-middle-east-28772478

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### ❖ ISIS Is Turning Food And Water Into A Weapon In Iraq

Since its rapid expansion across Iraq in June, ISIS has scored a number of tactical victories throughout the north and west of the country. These victories have placed a large swath of Iraqi territory within the group's control while also giving ISIS two crucial pieces of leverage — control over much of Iraq's food and water supply.

On August 7, after a series of battles with the Kurdish Peshmerga, ISIS succeeded in seizing the crucially important Mosul Dam. This dam, the largest in Iraq, impedes the Tigris River and supplies power to Mosul and the surrounding countryside. By controlling the dam, ISIS is now able to deprive its enemies of electricity while rewarding its allies with power, coercing at least some degree of local support.

More worryingly, ISIS could now destroy the dam if it wanted to. This destruction would wash away Mosul in a matter of hours and send 15-foot high floods to Baghdad within three days.

Fortunately, according to workers at the dam who have spoken to Bloomberg News, ISIS's one demand is to keep the dam running — for now, at least.

The dam provides ISIS with extensive leverage against the Iraqi government. The control of key pieces of infrastructure also gives further validity to the group's claim that it constitutes an actual state.

Natasha Underhill, a political scientist at Nottingham Trent University, told Bloomberg that control of the dam "provides the group with leverage against the Iraqi government and shows that they're a serious threat to the stability of the Iraqi state."

Aside from the Mosul Dam, ISIS has attempted to gain control of the Haditha Dam south-west of Baghdad, but has so far failed. Control of the Haditha Dam on the Euphrates River would be just as disastrous as control of the Mosul Dam — the Haditha Dam provides nearly a third of Iraq's electricity.

Alastair Newton, a senior political analyst at the Nomura Group, has written that the current conflict in Iraq hinges on the country's water supply. The largest risk for Iraq as a whole is if ISIS "can secure control of key water infrastructure."

A Fight For Food

ISIS's leverage doesn't just come from water resources. ISIS now controls large parts of five of Iraq's most fertile provinces, areas which are responsible for approximately 40% of the country's wheat crop. The militants have also seized a number of government grain silos throughout the north of the country, which contained somewhere from 40,000 to 50,000 tons of grain.

ISIS has seized an additional 700 tons of wheat from western Iraq. The grain was transportedto Syria for milling, before being brought back into Iraq. ISIS then sought to sell the grain to the Iraqi government through third-parties in order to raise further funds.

According to a source at the Agricultural Ministry who spoke to Reuters, ISIS puts upwards of30% of Iraq's entire farm production is at risk. This places significant strain of the Iraqi government, as well as Iraqi society as a whole.

"Now is the worst time for food insecurity since the sanctions [during Saddam Hussein's rule] and things are getting worse," Fadel El-Zubi, the Iraqi U.N. Food and Agriculture Organisation representative, told Reuters.

By controlling the water supply of central and southern Iraq, along with an astounding percentage of the country's agricultural output, ISIS could place significant pressure on the central government while maintaining a current military status quo that leaves them sitting on a Belgium-sized chunk of the Middle East.

"ISIS Is Turning Food And Water Into A Weapon In Iraq", 16/08/2014, online at: http://www.businessinsider.com.au/isis-has-two-major-weapons-in-iraq-2014-8

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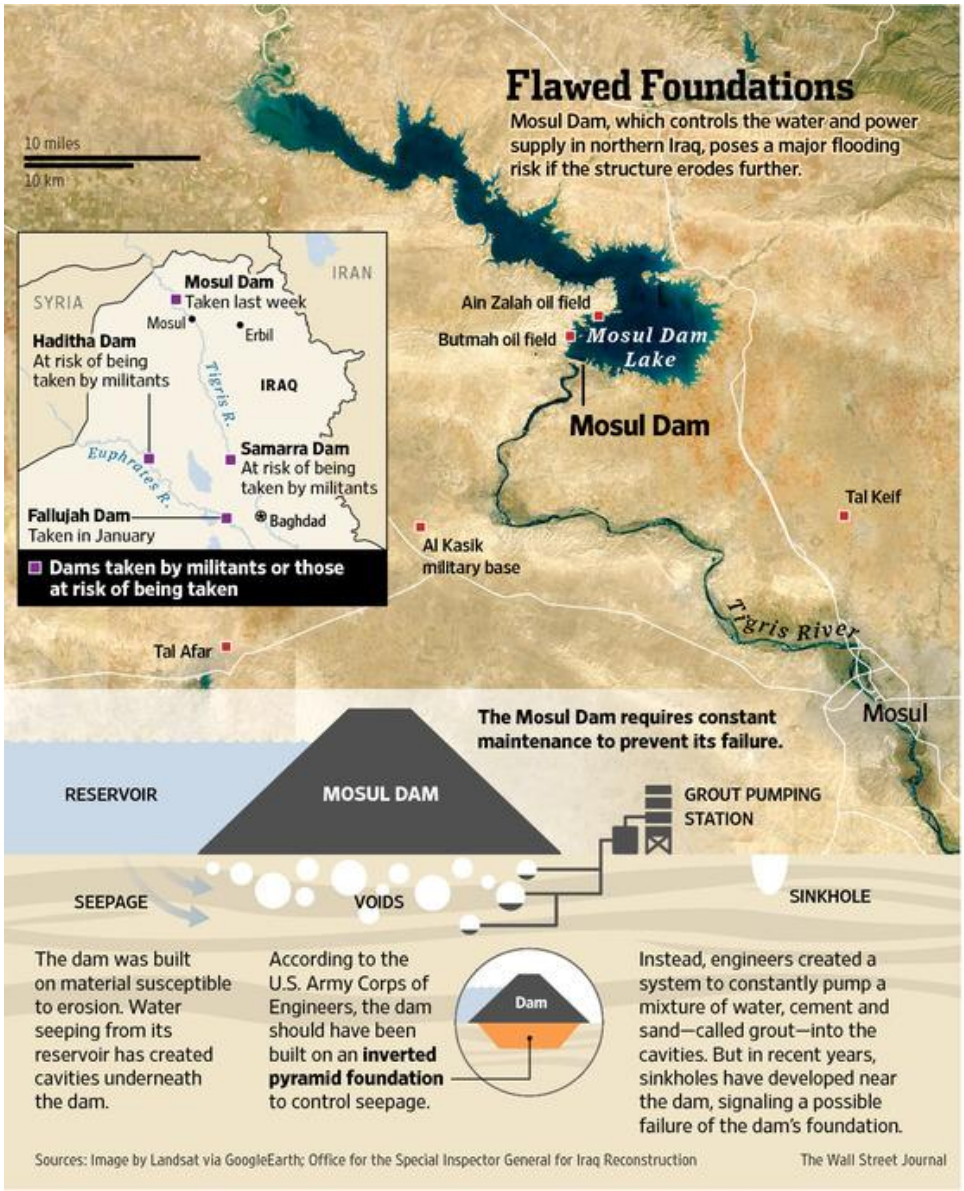
## ❖ Mosul Dam's Takeover by ISIS Raises Risk of Flooding

*Constant Maintenance Needed to Avoid Catastrophic Failure of Dam's Structure*

ERBIL, Iraq—Along with a creeping Islamist threat on Iraqi Kurdistan and the plight of thousands of Iraqis trapped on a mountainside, there was a scientific calculation behind the U.S. decision to intervene in Iraq: the potential for a 65-foot wave to engulf the northern city of Mosul, and even flood the central capital Baghdad.

The takeover of Mosul Dam, the country's largest, by Islamic militants on Aug. 7 was almost overshadowed by their blitz through several towns eastward, toward Erbil, the capital of the Kurdish-controlled region and home to thousands of U.S. citizens and government personnel.



Sprawled across the Tigris River in a valley north of Mosul, the dam controls the water and power supply in northern Iraq. U.S. and Iraqi officials say it could unleash deadly flooding if its foundation—which needs daily cement injections—further erodes.

It also puts a particularly lethal tool in the hands of an insurgent group that has strategically sought control of water resources in both Iraq and Syria, U.S. officials say. In Iraq, Islamic State already controls a dam in the country's west at Fallujah, and has moved on the nearby dam in Haditha.

"It's a high concern for us," said one senior U.S. official. "I don't know if it could fail in a day…but that's a key concern for us."

Some analysts said the Islamic State would likely use the Mosul Dam as a source of leverage in which it keeps the territory around the dam in exchange for continued water and power supply.

The core of the problem is the gypsum base on which the Mosul Dam was built. Gypsum absorbs and dissolves in water, creating cavelike holes that have required filling with a mix of cement and other substances—a process called grouting—daily for three decades. Without grouting, said Mr. Alwash, the base would erode and unleash flooding, probably within six months. It would take just hours to flood Mosul, about 30 miles downstream.

"It would be like a tsunami 20 meters high," he said. "You cannot run away fast enough."

A 2006 report by the U.S. Army Corps of Engineers, one of the agencies advising the Iraqi government on the structure, called it "the most dangerous dam in the world." The following year, a project assessment by the Office for the Inspector General for Iraq Reconstruction, a federal agency, reported inadequate construction, contract issues, and chaos in the delivery and maintenance of key equipment.

The U.S. invested more than $30 million upgrading, repairing and studying the dam between 2006 and 2010, said Stuart Bowen, the former U.S. inspector general for Iraq reconstruction. Mr. Bowen's report on the U.S. effort to improve the dam said the project had been plagued by mismanagement.

"You'd have to call that project a failure at the time we visited it," Mr. Bowen said in an interview Sunday.

The Islamic State seizure of the dam remains a source of disagreement in Iraq, a reflection of how catastrophic the potential for failure or damage is. Officials confirm reports from the ground that the militants took the dam from the Kurdish Peshmerga forces guarding it Thursday, after fierce clashes in the surrounding area. Officials in Baghdad and Erbil initially denied the reports and then went quiet. A representative for the Kurdistan Regional Government declined to comment Sunday.

Atheel Nujaifi, governor of Nineveh province where Mosul sits, said the Islamic State completely controls the dam. Grouting stopped the day of the takeover, he said, because most employees, including all of the engineers, fled that Thursday.

Only Abdulkhalek Dabbagh, general manager, remains at the dam, said Mr. Nujaifi, adding that he speaks to him regularly for field updates. An employee at the dam's power plant disputed that account, saying that at least a handful of engineers remain. Mr. Nujaifi fled the province after the Islamic State took Mosul on June 10.

Mr. Dabbagh "stayed when the militants approached and he said: 'If something happens here there will be whole cities that are destroyed. So if you want to kill me, I will die right here at the dam,' " according to Mr. Nujaifi's recollection of a conversation he had with the dam's general manager.

Mr. Dabbagh wasn't reachable to comment, and Mr. Nujaifi said he would not put him through for direct comment for security reasons.

Protecting the dam could fall under President Barack Obama's military authorization order, U.S. officials said, because flooding would endanger U.S. personnel in Baghdad. On Thursday night, after the authorization was announced, a senior administration official said "a breach of the dam could cause flooding that could compromise our embassy."
For now, the Pentagon's priority is to stop the insurgents from advancing on Erbil, create some space for Kurdish fighters to regroup and resupply, and find a way to rescue the Yazidi refugees on Mount Sinjar, officials said.

It is unlikely that the Kurdish Peshmerga, or U.S. airstrikes, would seek to reclaim the dam, given the potential for damage. And any damage would flood towns south of Mosul that are largely under Islamic State control, suggesting the militants may not be motivated to take that kind of action.

Mr. Nujaifi, the governor, said he doesn't believe the insurgents intend to bomb the dam. "However, what we fear is that they will play with the water level at the reservoir," he said, which would affect the supply of drinking water pumped from there. Already, militants have reduced the level enough to deprive Mosul of drinking water for two days, Mr. Nujaifi said.

"Mosul Dam's Takeover by ISIS Raises Risk of Flooding", 11/08/2014, online at: http://online.wsj.com/articles/mosul-dams-takeover-by-isis-raises-risk-of-flooding-1407799954

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### ❖ Iraq's water; Another threat

IRAQ depends on the Tigris and Euphrates rivers for drinking water, supplying industry and irrigating massive swathes of farmland. The two rivers account for 98% of the country's surface water. Until recently the government's greatest concern has been the fact that the source of neither river is in the country. In the past few decades dams and diversions across Turkey and Syria have steadily reduced the quantity of water reaching Iraq.

Now Iraq has a greater concern. Both waterways flow through areas of northern Iraq controlled by the Islamic State (IS), an extremist group that grew out of al-Qaeda in Iraq and today claims an area the size of Jordan straddling Syria and Iraq. On August 8th America began air strikes against the group, after IS carried out a series of attacks that targeted minorities including Christians and Yazidis and threatened the semi-autonomous northern area of Kurdistan. In one of those attacks, on August 7th, IS took control of Mosul dam.

After targeting oil fields in Syria and Iraq, IS may now have its sights trained on water. Mosul is not the only dam for which IS has fought. After taking large parts of Iraq in a campaign that started in Mosul, the country's second largest city, in June, on August 1st IS battled to take control of Haditha dam on the Euphrates in the eastern province of al-Anbar. The fighters were repelled by Iraqi troops and Sunni tribes, but reports suggest the offensive continues.

IS may want to control these resources in order to bolster its claim to run a state. But it may have additional motives. Baghdad and southern Iraq rely on water being released from these dams. So IS could cut off the water, limiting flows to Baghdad and the south or, conversely, release large amounts that could cause floods (although this would also flood areas controlled by IS, including Mosul city, south of the dam).

Any change in water flows would also affect the availability of food, because Iraq is heavily dependent on irrigation to grow wheat, barley, rice, corn and fruit and vegetables. IS has already taken control of a number of government wheat-storage sites in Ninewa, Kirkuk and Salaheddin provinces. Some reports suggest that it is using these to supply flour to residents in the provinces north of Baghdad who are now cut off from a public programme that distributes flour, rice, sugar,

and sunflower oil. Others reckon IS will sell the wheat—like it has oil—to local mills, bakers and farmers to generate additional funds.

Once again Kurdistan is best placed to ride out the trouble. The Greater Zab, the Lesser Zab and the Diyala rivers run through the area before joining the Tigris, contributing over half its annual flow. If the Kurds' Peshmerga forces managed to regain control of Mosul dam, Kurdistan would control around three-quarters of Iraq's surface water before it enters areas under IS control.

"Iraq's water; Another threat",11/08/2014, online at: http://www.economist.com/blogs/pomegranate/2014/08/iraqs-water

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### ❖ Save one dying lake, save the Middle East?

**(CNN)** -- Lake Urmia in Iran used to be a site to reckon with.

Twenty years ago, it ranked as the sixth largest saltwater lake in the world, and the largest in the Middle East. Tourists would revel in the lake's buoyancy (like the Dead Sea, the salt level made it impossible to sink), and the flocks of flamingos, pelicans and yellow deer that once inhabited the surrounding areas.

Today, Urmia is a shadow of its former self. Decades of poor water management, aggressive agricultural policies and drought have rendered it almost completely dried up (according to the United Nations Development Program, the lake has shrunk by two-thirds since 1997).

Rusted boats lay abandoned in what is now essentially a giant salt flat. The tourists are long gone, as are many of the animals that once called the lake home.

"It's like seeing a scene from a different planet. I saw caterpillars and bobcats taking salt from the dead body of the lake," recalls Gary Lewis, the United Nations Resident Coordinator in Iran.

"It's a testament to how rapidly we can break something."

It's a problem that President Hassan Rouhani is aware of, and one he wants to fix. Last month, he agreed to spend $500 million in the first year alone of a ten-year recovery plan (the total bill is $5 billion).

"If the lake dries up, this kind of threat will not be comparable to any other threat," he said in a public statement in January.

It's not an overblown statement. According to experts, Iran is on the brink of a water crisis.

"In the year 1956, the per capita water available in Iran was 7,000 cubic meters. Today, it is 1,900 cubic meters. In the year 2020, it is likely to be only 1,300 cubic meters," says Lewis. The estimates fall far short of the 30 million cubic meters he believes will be needed to accommodate the burgeoning population -- which could reach 90 million in the next decade.

Shortages are cited throughout the country, not just at Lake Urmia, but in the Hamoun Wetlands in the east of the country -- a one-time oasis surrounded by fishing villages that has since dried up. In 2012 alone, the Hamoun water crisis sent 600,000 environmental refugees into the north of the country.

Lewis worries that as water shortages become the norm, not only will Iran face repercussions to the economy and public health, but that it will start to have a knock-on effect on the Middle East as a whole.

"People are vulnerable when they migrate. When they come crashing into someone else's neighborhood, they become a threat to those people's economic security. Add in ethnic or linguistic differences, and that can be a real source of conflict," he says.

Read: Sex, lies and lithographs -- a Persian epic for the masses

**A new Iran?**

Iran is doing more than throwing money at the problem. In March, Iran's Department of Environment, together with the UNDP, held a conference with hundreds of international experts on how to solve Iran's water shortage problem, and ultimately approved 24 separate projects.

"When Rouhani took power, in the first government meeting, he ordered the formation of a special group to save Urmia and the other dying wetlands," recalls Naser Agh, a professor at the Artemia and Aquatic Animals Research Institute at Urmia University, and a member of the steering committee of the Lake Urmia restoration program.

The mission to save the lake is complex, and Agh admits that even in ten years, it will only restore Urmia to half its original size.

"No single measure can help the lake. Lots of things have to be done at the same time," he says.

The influx of money and manpower demonstrates a sizable shift in how the new administration is addressing the problem -- partly, in that they're willing to address it at all.

Thus far, Iran's environmental record has been pretty poor. The country is the world's ninth top producer of greenhouse gasses, according to according to the US Energy Information Administration, and is home to the world's eighth most polluted city.

"The past government would say we needed to save the lake, and would even form a national committee and ministers would come together, but there was never a budget, and without a budget, you can't do anything," says Agh.

"This new government is very different. They also approved a large amount of money, so it can really help save the lake."

"Save one dying lake, save the Middle East?", 14/08/2014, online at: http://edition.cnn.com/2014/08/14/world/meast/save-one-dying-lake-save-the-middle-east/

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## ❖ WaterWorld Middle East holds keys to efficient and sustainable water infrastructure

*Abu Dhabi, 16 August, 2014: The upcoming WaterWorld Middle East conference and exhibition will play a key role helping governments in countries such as the UAE to meet the infrastructure demands of booming populations, the Honorary Vice-Chairman of the World Energy Council said today.*

"A dependable supply of water is not only crucial for life, it's essential for building a healthy and vibrant economy," said Dr Hisham Khatib, the Honorary Vice-Chairman who is one of the keynote speakers at the event this year. "By bringing cutting-edge technology together with industry experts, WaterWorld Middle East is a superb forum to promote sustainable water infrastructure development in the region."

The WaterWorld Middle East Conference and Exhibition will run in tandem with POWER-GEN Middle East from 12 to 14 October at Abu Dhabi National Exhibition Centre (ADNEC). The event will bring together the region's leading plant owners and operators, consultants, utilities, investors and academics, with representatives of over 80 companies from 30 countries.

"WaterWorld Middle East comes at a crucial time for the Gulf Cooperation Council, when local governments are looking to invest over US$130 billion over the next decade to meet future water and energy demands," said Tom Freyberg, the Conference Director of WaterWorld Middle East.
Segments of the water and wastewater industry in the GCC are growing at between 14 and 20 percent.

Freyberg said: "To meet growing demand, there's more focus on sustainable practices, wastewater reuse and asset management - these issues will all feature strongly in WaterWorld Middle East 2014. There are opportunities for domestic and international companies, including small to medium Original Equipment Manufacturers (OEMs), local fabricators, EPC contractors, and design and engineering companies and consultants."
In Abu Dhabi, driven by population growth, demand for potable water and subsequent sanitation services are expected to double from now until 2030. Three major desalination projects are in the works, as are plans to reduce distributed losses of desalinated water. Four major wastewater

treatment works in Abu Dhabi and Al Ain have been commissioned to replace and expand the capacity of existing plants, which are coming to the end of their working lives.

Major projects underway include Abu Dhabi Sewerage Services Company's (ADSSC) Strategic Tunnel Enhancement Programme (STEP), which will have the capacity to treble the capital's current collection capacity. When complete, STEP will be one of the largest tunnelled sewerage systems in the world, supporting Abu Dhabi's growth and reducing operation and maintenance costs. As Event Partner for WaterWorld Middle East, the ADSSC's Managing Director Alan Thompson will be a keynote speaker, presenting an update on the STEP project and give delegates a chance to see the visitor centre as a technical tour.

Other local organisations speaking in WWME 2014 include the Abu Dhabi National Energy Company (TAQA) on the Al Zawra reverse osmosis desalination project and also the Regulation and Supervision Bureau (RSB) on Abu Dhabi's Water Reuse Framework.

"WaterWorld Middle East holds keys to efficient and sustainable water infrastructure", 16/08/2014, online at: https://www.zawya.com/story/WaterWorld_Middle_East_holds_keys_to_efficient_and_sustainable_water_infrastructure-ZAWYA20140816103059/

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## ❖ Three International Water Conflicts to Watch

***China-India: The Brahmaputra River***

The Brahmaputra River is a 2,900 km river that originates in Tibet and flows through India's Arunachal Pradesh state before merging with the Ganges and draining into the Bay of Bengal in Bangladesh. It is considered an important resource in all three countries that it flows through: for energy-hungry China, it provides hydroelectricity; and for India and Bangladesh, a key agricultural lifeline in otherwise overpopulated and arid region.

The Brahmaputra River is particularly important to the agricultural industry in India's Assam plains, and worries have arisen recently regarding a series of hydroelectric plants that China is in various stages of construction on its Tibetan plateau. Some experts believe that these projects will reduce the flow of the Brahmaputra in India, compounding an already tenuous water situation in the affected areas.

While there is no comprehensive bilateral treaty in place for the sustainable management of the Brahmaputra River, some steps have been taken recently by the Modi and Xi Jinping governments, mainly in the form of an information sharing agreement for hydrological data. But until cooperation becomes more entrenched, the Brahmaputra River remains a potential source of friction between two of the world's preeminent rising powers.

***Ethiopia-Egypt: Grand Ethiopian Renaissance Dam and the Nile River***

In 2011, the Ethiopian government announced plans to build the 'Grand Ethiopian Renaissance Dam' – a $4.1 bn, 6,000MW-capacity hydroelectric dam on the Blue Nile near the border with Sudan. The dam is meant to capitalize on Ethiopia's considerable hydroelectric potential and provide electricity for not just Ethiopians but regional populations as well. However, some fear that this dam will trade one problem for another. And by shoring up its energy supply, Ethiopia might be jeopardizing its water security by increasing the volatility of a river that already has a long history of being difficult to predict.

The potential impact on water supplies, particularly downriver, is a grave concern in Egypt; which, unlike neighboring Sudan, has consistently opposed the construction of the Grand Ethiopian Renaissance Dam from the start. Cairo's legal argument defers to treaties from 1929 and 1959 that

guarantee Egypt two-thirds of the Nile's waters along with the right to veto any upstream projects – a right that was ignored when Ethiopia unilaterally went ahead with construction.

Efforts to foster a multilateral approach to developing the Nile basin have so far failed, as evidenced in the 2010 Cooperative Framework Agreement that saw upriver countries join together against the downriver countries (Egypt, Sudan) who refuse to give up their historical rights despite changing economic power dynamics in the region.

The Grand Ethiopian Renaissance Dam is expected to be completed sometime in 2017.

***Turkey-Iraq: Ilisu Dam and the Tigris River***

Turkey's newly re-elected Erdogan government has been keen to push through the final part of its long-running Southeastern Anatolian Project: the Ilisu Dam on the Tigris River near the border of Syria. The Ilisu Dam is the most recent in a long line of Turkish projects meant to tap into the hydroelectric potential of both the Tigris and Euphrates rivers, and once completed the Ilisu Dam will generate 1,200 MW, or roughly 2% of Turkey's energy needs.

The Southeastern Anatolian Project entailed the construction of some 22 dams and 19 hydroelectric plants in the Tigris-Euphrates basin, so this is an international water conflict that has existed for quite some time. The big loser in Turkey's upstream activities is Iraq and, to a lesser degree, Syria. Iraq has historically enjoyed the lion's share of these rivers' waters, which have historically supplied the seasonal marshlands needed to grow food. But these waters have been receding over the past decade, even well before the Ilisu Dam's completion. In fact, northern Iraq and Syria are currently experiencing droughts so protracted that some analysts are questioning whether or not they have contributed to the rise of ISIS in the region. Some of the more extreme projections hold that, owing to a combination of climate change and upstream dam activity, the Tigris and Euphrates rivers won't have sufficient flow to reach the sea by as early as 2040.

"Three International Water Conflicts to Watch", 11/08/2014, online at: http://www.geopoliticalmonitor.com/three-international-water-conflicts-watch/

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### ❖ Water Disaster Hits Every Single Person In Gaza

**R**ight now, none of the 1.8 million Palestinians living in the occupied and besieged Gaza Strip has access to a safe and secure supply of water.

The water situation was already severe before Israel's bombardment began on 7 July. But now water experts are calling it a disaster.

Ninety percent of wells, wastewater treatment plants and desalination plants cannot operate due to power cuts and lack of fuel.

In the video interview above, Monther Shublak, director of Gaza's Coastal Municipalities Water Utility, says that much of the infrastructure has been damaged by Israeli bombing.

This includes Gaza's central sewage pumping station which was recently upgraded with German taxpayer funding.

The wastewater treatment facility in Gaza was hit twice, he says, and could cause an environmental disaster in Gaza City.

Three wells and "a long list of water carriers and wastewater carriers" were damaged or destroyed all over the Gaza Strip, he says.

The Beach Well, which provides seawater to the only functioning desalination plant, was also destroyed.

**Water workers killed**

Trying to maintain the flow of water to people has been incredibly dangerous. Seven water technicians were killed while on duty at the height of the Israeli attack when almost half of Gaza's territory was declared a no-go zone (see infographic below).

One of the workers, technician Zeyad Al Shawi, died on 14 July from critical injuries he suffered during an Israeli airstrike on 12 July as he opened valves to supply water to people in Rafah, southern Gaza, **the Coastal Municipalities Water Utility reported.**

Due to the risks, workers could not access areas to carry out repairs or to operate pumps and open and close valves to direct water to different neighborhoods.

Repairs are also hampered because Israel's eight-year-long siege prevents the importation of needed materials.

Water experts estimate the damage to be at least $20 million.

"The money of taxpayers or UN agencies is again and again wasted … during these endless wars," Shublak says, referring to the constant cycle of donor-funded infrastructure being destroyed by Israel and then repaired with international aid.

**Living without water**

In the below video called Water Deprived, Fatma, a 45-year-old mother of nine from the heavily bombed Shujaiya neighborhood speaks about the difficulty of living with the unsanitary and health-threatening conditions caused by the water crisis.

She and her family were displaced to a school run by UNRWA, the UN agency for Palestine refugees. Three thousand people took shelter in that school alone and Fatma and her family are living in a classroom with 41 people.

"Contamination of water and lack of hygiene in the bathrooms can cause health problems," she says. "We have so many children experiencing diarrhea and fever and they have to be treated now. We don't want to risk the health of our children."

A quarter of Gaza's population was displaced at the height of Israel's attack. As of yesterday, 370,000 people remain in temporary shelter, according to the UN.

Up to 100,000 people will need to be permanently rehoused because their homes were destroyed or severely damaged.

**Gaza water disaster**

The infographic below, produced by EWASH (the Emergency Water and Sanitation-Hygiene Group), highlights some of the facts about the Gaza water disaster.

It summarizes key facts about the critical damage to the water, sanitation and hygiene sector during the Israeli assault on Gaza, between 8 July and 5 August.

EWASH (**ewash.org**) is a coordinating body made up various stakeholders in the water, sanitation and hygiene sector in the occupied Palestinian territories. These include national and international nongovernmental organizations, UN agencies, academic and research institutions, the Palestinian Water Authority, the West Bank Water Department and the Coastal Municipalities Water Utility in Gaza.

"Water Disaster Hits Every Single Person In Gaza",14/08/2014, online at: http://www.countercurrents.org/abunimah140814.htm

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### ❖ Showers dry up as water shortages add to Gaza misery

Gaza City (Palestinian Territories) (AFP) - Feriel al-Zaaneen hasn't had a shower in more than a month. Like thousands of Palestinians, she doesn't have enough water to wash, adding to the miseries of life in war-battered Gaza.

In searing summer heat, where temperatures can reach 34 degrees Celsius, (93 Fahrenheit), Feriel is one of more than 218,000 refugees sheltering in 87 UN-run schools from a conflict that has killed at least 1,980 Palestinians and 67 on the Israeli side since July 8.

"There's no water here and the toilets are very dirty, this is no kind of life," she said.

Zaaneen, her children and grandchildren, some 50 people, fled the Israeli bombardment of their homes.

She says she faces a daily struggle to get water, a precious resource in the Hamas-controlled enclave which has been under Israeli blockade since 2006.

The UN says that 365,000 Palestinians are still displaced in Gaza, like 37-year-old Faten al-Masri, who has to wash her children with bottles of drinking water.

As she sprinkles cold water on her two-year-old daughter, the toddler screams, her skin covered in angry red blotches.

"All my children got sick here because of the dirt and the lack of hygiene, they've all got skin infections and scabs," Faten said.

"There is no water in the bathrooms, and they were so dirty that we couldn't even go inside," she said.

"I have been bathing my sons every three days here in the classroom with bottles of water."

- No privacy -

She herself has not taken a shower since arriving at the school two weeks ago.

"Some people use water bottles inside the class, but I can't bring myself to do it. It would feel like I was taking a shower in the street if I did that. Anyone could open the door and come in, there's no privacy," she said.

"I feel really bad. Not being able to shower makes me feel restricted and anxious," she said.

Muntaha al-Kafarna, a mother of nine who has been living in a small tent she set up in the courtyard of the same school, near the toilets, managed to shower at a nearby hospital in the northern Gaza Strip.

"The water was cold, and there wasn't very much of it, but I didn't have any other solution," she said.

"People are fighting here in the school to use the toilets, my sons wet themselves before their turn comes," she said.

She points to her children, stood around her. She bends down and inspects the fair hair of her one-year-old son, picking out a louse.

"My sons have caught lice and nits because they can't shower here," she said.

"I wish a missile would hit us, me and my children. Dying is better than this life," she said in despair.

- Water crisis -

Her husband Hazem agreed.

"It's not really living," he said, his chin pocked with red spots he says were caused by poor hygiene in the school.

Ashraf al-Qudra, spokesman for the health ministry in Gaza, says skin diseases, rashes and itchiness have been reported in shelters housing refugees.

Among the children, there have been "many cases of chronic diarrhoea" and "several cases of meningitis reported", he added.

Adnan Abu Hasna, a spokesman for the UN agency for Palestinian refugees (UNRWA), says there are water shortages not only in shelters for the displaced but across the entire enclave.

"Because of the Israeli bombardment of the infrastructure, there is a lack of water across the Gaza Strip," he said.

Most residents suffered water shortages even before the war, but now Monzer Shoblak, an official from the local water board, said war damage meant that Gaza was pumping 50 percent less water.

Shoblak's water authority declared Gaza a "water and environmental disaster area".

The territory's only power station was knocked out by Israeli shelling during the conflict, practically stopping the provision of drinking water, he said.

Samar al-Masbah, 27, who lives in Al-Zahra City southwest of Gaza City, said water to his home had been cut off around 10 days ago.

"When the water comes, the electricity cuts, so the water doesn't get to the tanks on the roof because it needs a motor to push it up," she said.

"Showers dry up as water shortages add to Gaza misery", 16/08/2014, online at: https://news.yahoo.com/showers-dry-water-shortages-add-gaza-misery-030624240.html

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### ❖ Agriculture Ministry to farmers: Separate West Bank, Golan Heights products ahead of EU ban

In a letter recently sent out by the Ministry of Agriculture to Israeli dairy and livestock producers, Israeli farmers were told to start separating out their products that come from beyond the Green Line ahead of the European Union's boycott of dairy, poultry, eggs and meat that come from the West Bank and Golan Heights. The separated products will then not be sent to the European Union.

The EU's ban is designated for products from the West Bank and Golan Heights, but would technically include certain parts of Jerusalem, though no Israeli goods are produced there anymore.

In accordance with instructions from the Foreign and Finance ministries, the letter goes on to state that farmers must present the ministry with a list of farms over the Green Line from which they receive raw materials that are combined with materials from multiple farms. This is being done in order to separate end products, such as powdered milk, that could include materials from both farms over the Green Line and farms within the EU's definition of Israel.

Currently, products sold in the European Union that come from over the Green Line carry a label, but are not banned outright.

The European Union agreed to the Green Line poultry, egg, meat and dairy ban on February 17 of this year. The ban is supposed to go into effect on September 1.

"Agriculture Ministry to farmers: Separate West Bank, Golan Heights products ahead of EU ban",15/08/2014, online at: http://www.jpost.com/Israel-News/Politics-And-Diplomacy/Letter-to-farmers-Start-separating-your-West-Bank-and-Golan-Heights-products-371202

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### ❖ German 'reneges' on optional fluoridation of drinking water

Three leading public health and dental experts have accused Health Minister Yael German of going back on a commitment to make fluoridation of drinking water optional, according to a letter obtained by *The Jerusalem Post*, due to be sent to the minister on Tuesday.

Two months ago, the Health Ministry said that German had agreed to cancel her decision to prohibit fluoridation of drinking water around the country – and allow municipalities to decide independently if they wanted it. However, the deadline is due to end August 26 and German has yet to sign the regulation-change that would make it possible.

Her personal spokeswoman said this was due to "technicalities."

Hebrew University School of Public Health emeritus Prof. Ted Tulchinsky, Hebrew University-Hadassah Dental Faculty Prof. Harold Sgan-Cohen and his colleague Dr. Yuval Vered said Monday that the minister's defense of her position was based on "populist arguments, supported by amateur studies – and ignored dozens of years of research in Israel and the world [that absolutely showed] that there is no better health, economic and social substitute for adding fluoride to the tap water in Israel."

They also accused German of "setting her policy based on a political and sectorial basis."

Tulchinsky, who had held a senior public health position in the Health Ministry, said: "This is absolutely shocking arrogance.

The health minister has misled the Knesset and the public.

She has not consulted with the local authorities," this will harm poor children, primarily in the peripheral communities of the country. "Banning fluoridation is an anti-social measure that will be a scar on her performance and [on] government colleagues who permitted her to initiate and allowed this travesty [to] take place."

German opposed countrywide fluoridation as health minister since taking office, arguing that if adding the gas was needed "only" to protect children's teeth from decay, then the entire population should not be exposed to it and other means should be used.

When German was mayor of Herzliya, she stopped fluoridation in her city. But her position on the matter was strongly opposed by the ministry's top public health experts, who attempted to persuade her of the benefits of fluoridated water.

The nation's water has been fluoridated for decades, and 405 million people in more than 60 countries around the world get fluoridated water delivered to their taps.

On June 21, leading public health and dentistry experts, the mayor of Dimona and the head of the Beduin Hura local council near Beersheba hurled strong criticism at German for canceling the requirement for municipalities to fluoridate their drinking water last year.

This culminated in a campaign against her policy and the first protest letter, signed by experts in academic public health and dentistry.

In the letter, they had said that millions of households will be forced to spend money to repair the damages caused by this decision and that German would be responsible for serious dental decay in the mouths of underprivileged children who do not have the luxury of getting the fluoride treatments or regular brushing with fluoride toothpaste that well-off children get.

The day after the June protest letter was sent, Director of Public Health Services Prof. Itamar Grotto said on behalf of German that she had changed her mind and decided to sign a regulation that would make the municipalities' decision to fluoridate an option rather than to prohibit it.

When public health experts learned this week that the minister had not signed the order, they renewed their protests, and over 20 mayors from around the country have been invited to sign a new petition; some have already signed.

These include mayors from Eilat, Dimona, Beersheba, Yeroham, Ashdod, Ashkelon, Bat Yam, Jerusalem, Kiryat Shmona, Kiryat Ata, Elad, Bnei Brak, Modi'in, Rehovot, Ness Ziona, Tivon, Tel Aviv, Rishon Lezion and Kiryat Gat.

The ministry refused The Post's request for an interview regarding the "technical problems" that would require new legislation to allow fluoridation, and had yet to provide an official comment by press time.

"German 'reneges' on optional fluoridation of drinking water", 12/08/2014,online at: http://www.jpost.com/Health-and-Science/German-reneges-on-optional-fluoridation-of-drinking-water-370818

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### ❖ Ethiopia: In Defense of Ethiopia's Dam and Its National Interest

An estimated 50,000 large dams now exist in the world. There are 300 major dams - giants - China has 19,000 dams, Brazil, the US (5,500), India, Japan, Russia (516). They are all food self-sufficient and with a sufficient supply of energy.

Out of the top 54 largest dams, 12 are in China, 6 in Brazil, 3 in Venezuela, 6 in the US, 7 in Russia, 8 in Canada, 1 in Pakistan, 1 in Argentina, 1 in Paraguay, 1 in Tajikistan, 1 in Mexico, 1 in Turkey, 1 in Vietnam, 1 in Malaysia, 3 in Iran, 1 in Romania, 1 in Vietnam, 1 in Malaysia, 1 in Tajikistan, and 1 in India.

There are now 23 new of the largest dams under construction. These include 12 in China, 2 in Brazil, 2 in Pakistan, 2 in Myanmar, 1 in Ethiopia, 1 in Venezuela, 1 in Tajikistan, 1 in India.

What do these two sets of lists of dams tell us? Their economic growth? Level of industrialization? Availability of power? Population size? Level of poverty and the number of people they lifted out of poverty? For example, China has lifted 500 million people out of poverty within a few years. What is the record of IRN in regard to these Dams? How many of them has it moderately approved? Do these dams belong to developed or developing nations? Who needs the dams most? For how many of them does the IRN engage in leaking confidential studies and documents? The answers will be telling. Every Tom, Dick and Harry wants to come to our kitchens and cook; wants to tell us what to do and tell us how our engineers are incompetent and how theirs are knowledgeable. However, the United States completed the John Jay Dam in 1949, the Hoover Dam in 1936/39 and then uplifted it in 1961; Russia completed Samayskaya Dam in 1957, and Bratsk Dam in 1967. Brazil completed Ilha Solteira Dam in 1973 etc. After those, many years and technology have advanced. Almost all engineers engaged in the new dams are trained at world-class universities, companies like Salini of Italy working in Research and Development are known for their know-how and experience. I do not think the IRN experts can question Italian know-how on construction (experience since early Roman Empire). The Egyptian engineers have shown their talent when they questioned and disagreed on some issues with the Russian engineers to accelerate the process and proved to be right in the process of building Aswan. Same way Ethiopian engineers are well qualified and cannot be evaluated by the

so-called profession of political science whose judgement is blurred and focused as well as obsessed in opposing EPDPF. Ethiopian experts cannot and should not be called dogs in such a self-degrading and racist manner. The equipment they use and the tools they implement are much better and are improved each year, they are more sophisticated and have better usage than the ones used in the old dams mentioned such as the ones completed in the 1950s. The GEAR uses better equipment, better tools and better-trained professionals and more experienced engineers than the ones used in the Aswan Dam with all due respect and a brotherly gesture to the Egyptian brothers.

Surprise, surprise. So what makes the IRN - the new kid on the block born in 1985 - the expert to make the judgement on the design, quality and know-how of building the GEAR. What makes them more concerned for the "indigenous peoples" of Ethiopia living around the site of the Dam more than the Ethiopian engineers and the Ethiopian?. One wonders!

Lets get real. The equipment and engineering skills used to build the Chinese subway system or the bullet train; the Franco-British bullet train is much more superior than the New York subway system and the US rail network. That does not mean they are better than American engineers or technology. It is just a technology transfer. The same is applied to Ethiopian Dams. Salini has access to all the state-of-the-art technology. Maybe IRN needs a reality check on understanding of the complex issues, the propaganda skills of many-sophisticated operation, the Egyptian and Eritreans intelligence operations. For example, Eritrea agents in cooperation with Egypt have been in an active Internet and e-mail campaign by the fellow Abrehet Gebre Selassie - Freedom for Ethiopia - that collects, channels and distributes anything that can damage Ethiopia, divide and destroy us. After all, Ethiopian experts are named dogs of dam wars, crackle hyenas in a pissing contest, and whack bush cadres by vulgar critic and IRN so-called experts to get out of its state of confusion. The venomous attack has no boundaries in trying to degrade Ethiopians. This will not deter the Ethiopian experts but increase their resolve to get the job done. History is a witness.

Economic logic of Ethiopia's dam

So far, Ethiopia has paid 27 billion birr (891.9 million pounds or USD 4 billion) of a total project cost of 7.7 billion birr for the Dam, which will create a lake 246 kms long.

It is the biggest part of a massive programme of public spending on power, roads and railways in one of Africa's fastest growing economies.

Ethiopia's output has risen at near double-digit rates for a decade luring investors from outside. This progress has to be backed by the most needed energy to sustain it. Sustainable development is the name of the game and we should resist detractors.

The argument that says: "The project will stifle private sector investment and will restrict economic growth and squeeze private sector investment," which according to this argument would hurt future growth prospects and the ability to pay for other infrastructure, is questionable. There is plenty of evidence that productive public investment in infrastructure does not crowd-out private sector investment; rather it crowds in private sector spending if the projects are well managed and implemented. A key consideration for private sector investment is risk. Any uncertainty depresses private sector spending so efforts to destabilize the public investment programme will depress private sector investment, both domestic and external. Ethiopia has a small private sector and it is impossible to raise funds for infrastructural development without the role of the State. The conditionality and cost of investment from the external private sector needs is time consuming, complicated and not that helpful for rapid development. The external private sector will be more attracted and internal private sector will also rapidly grow once the energy and road infrastructures are addressed.

Ethiopia is capable of financing few mega projects. The dam's cost of more than USD 4 billion is roughly 12 percent of Ethiopia's annual output and, stretched over several years is possible to finance. With the participation of the public, it is attainable and also sends a clear message to Ethiopia's partners and others alike.

The dam will help to control seasonal floods that devastate the rural population, improve irrigation aiding fisheries (adding fish to the population diet), regular water supply etc. The supply of fossil fuel in the area is diminishing and the dam will provide the cleanest and environmentally friendly hydropower energy. The region and Ethiopia's environmental problems are not Dams, but deforestation, soil erosion and seasonal drought. To address this, the dam is the best solution.

The dam and its related activities - irrigation, sustainable agricultural production, sustained availability of electricity to schools, clinics and households' uses and helps lift people out of poverty. The dam will help rural infrastructure logistics and supply improvements.

Economically speaking, hydroelectricity is cheap to produce. It is a renewable, sustainable form of energy that does not generate greenhouse gases. The cost of building the dam is much less than the many years of economic and social benefits, as well as its transformational impact. In general, hydropower produces little carbon dioxide, except for the cement and steel used for construction.

Ethiopia has no other choice of meeting its growing energy needs. It cannot meet its needs by importing hydrocarbon fuel, it is too expensive and not affordable the more the economy grows. Hydropower is the best and may be the only option. The energy needs have a lot of impacts on other societal needs such as agriculture, health, education, home economics, transport and small and large-scale industrialization. Electricity is the more efficient and cheaper source of energy for Ethiopia, over hydrocarbon (oil and gas) or fossil fuels (wood and animal manure).

The purpose of our dam is not to harm anyone or any other country. It is to improve the life of the people, provide drinking water, support economic growth and water power, fisheries, flood control, irrigation to increase agricultural productivity and food security and above all to produce electricity to generate power for domestic use and export to earn badly needed foreign exchange for our economy. The irrigated fields of Western farmers feed the US and other parts of the world, and Indian irrigation systems have enabled the country to be self-sufficient in food production. So, why not Ethiopia? In addition, in many parts of the world, dams have helped to remedy life-threatening problems such as poverty from lack of economic development, famine as a result of drought, devastation from floods and continued disease from lack of portable water supplies.

For Ethiopia's conscious, efforts are being made and there will be no significant disruption of the ecosystem, or decline of fish stock (the surrounding people who are not fish eaters will have a chance to add fish to their diet), and no forced resettlements. So there will not be disastrous or ecological and social impacts.

The dam's reservoirs will be critical for community water storage in a society where women have to travel hours carrying buckets on their backs to fetch water.

As to the criticism that says "the reservoirs could be ideal breeding grounds for mosquitoes, snails and flies with diseases such as malaria, schistosomiasis and river blindness,' the response is that these diseases already exist and actually the dam and related activities will help to eradicate them. In addition, Ethiopia for the first time has built rural clinics and trained rural health workers to help combat these diseases already as part of its economic transformation plan. In addition there is a five-kilometer buffer zone for malaria control that will not be available for human settlement.

Ethiopia's majority population relies on traditional methods of fuel, firewood, charcoal, certain crops or manure. Therefore, the dam has significant contributions towards energy self-sufficiency as well as environmental sustainability.

In short, the dam will help Ethiopia launch rural electrification. Well-planned, carefully targeted and effectively implemented rural electrification programmes will provide enormous benefits to rural people. Providing electricity supply will only make significant contributions to sustainable rural development when the other necessary conditions are present. Ethiopia has closely recognized that and is systematically working to fulfill those conditions. Availability of agricultural inputs, access to health and education services, reliable water supply, road infrastructure, access to markets, and adequate dwellings are the more obvious of these conditions.

The Ethiopian Electric Power Corporation (EEPCo) has done the proper background work on capital investment costs, level of local contribution, number and density of population, and the likely demand for electricity. It recognizes that cost recovery is the single most important factor determining the long-term effectiveness of rural electrification. It also recognizes the importance of operational subsidies for rural and urban power users. Putting rural electrification tariffs at a realistic level is considered critical. Lowering the barriers to obtaining a supply and such as initial connection charges are seen as important.

Ethiopian experts are relentlessly working to address the concerns expressed and identified in relation to the dam. They have looked into lessons learnt from previously built large dams, rivers and the environment. The dam, availability of electricity and irrigation water will address environmental problems such as deforestation and soil erosion, flooding etc. Ethiopians are making sure that the cultural lifestyle and languages of the people are respected, but they are lifted out of poverty from

wood consumption for energy to electric consumption, provided drinking and irrigation water from the dam, provided water to grow cattle feed and agricultural productivity. A kind of thing strange for Californian IRN experts who think of us as a mosaic and exotic people who should stay the way we are to amaze them and to take pictures and pity us with little donations to keep us aid-dependent.

-Ethiopians have concerns for marginalized societies, poor farmers and indigenous people. People who have irrigable land, electricity in their houses will create jobs and indigenous businesses will flourish. This is a policy move as well a national economic behaviour by the people.

-Ethiopians are working with nature. What Ethiopians are trying to do is to build resilience and reduce the natural environmental costs while providing energy and water as well as irrigation for agricultural productivity and animal husbandry. The Blue Nile, when it is in Ethiopia is a healthy clean river with fresh water and has a healthy watershed not used much by the people. IRN should ask Egyptians about the pollution.

-The concern of salination of the soil and water in the part of Ethiopia where the dam is built is out of question. It does not exist in Ethiopia, only in Egypt and Sudan. The extreme high rate of evaporation and desert encroachment is non-existent in Ethiopia where the dam is built. The chances of over irrigation like Egypt and Sudan are out of the question again. The area is not salty and there is no need to flush the salt as in Egypt. The water that could be used in Ethiopia for irrigation and drinking is very limited with no significant impacts on Egypt and Sudan. We learnt from the lesson of the Aswan High Dam's impoundment of 120 million tons of silt from Ethiopia's Blue Nile that vastly depleted the Egyptian sardine industry's fish stocks, which once fed organisms that were nourished by the 30,000 tons of silt deposited each year in the Nile delta.

-Ethiopia's efforts to build the dam are public. Environmentalists, utilities organizations, engineers, socio-economist, and local administration representing the people in the area have all participated. The author is not claiming as some readers might twist the argument saying Ethiopia is a Democratic state with an American, British or Scandinavian model. I am not. Ethiopia is not a Democratic state by that standard or by many. But that does not prevent us from doing what is claimed has been done here in the process of constructing the dam. All the segments of the society mentioned above have participated as stated in the process of constructing the dam. It may be hard for some to accept but I

believe the majority of Ethiopians support the dam and many have contributed money. Just like the Aswan Dam, with the dedication of the Ethiopian people, the dam will be built.

Questioning engineering and technical capacities:

There is always room for continued improvement and progress in any engineering project. So if there are technical problems, they will be addressed and fixed. Even NASA, the most advanced engineering entity engaged in extremely sophisticate devices make adjustments and fix problems. So technical issues should not be dramatized and be the reason to stop building Ethiopia's dam. It is a simple propaganda ploy to stop and disrupt construction.

Ethiopia is building a gravity dam. The site for the Grand Ethiopian Renaissance Dam (GERD) was identified by the United States Bureau of Reclamation during a Blue Nile survey conducted between 1956 and 1964. The Ethiopian Government again surveyed the site in October 2009 and August 2011.

Engineers have laid compacted concrete to the foundation on the barrage that will stand 145 meters high and whose turbines will throw out 6,000 megawatts - more than any other hydro dam in Africa.

Ethiopia has made a comprehensive assessment of the dam, devised an approach with good strategic planning, and the impact on all angles including the community are well assessed and considered.

Dams emerged following the development of the turbine in 1832. Improvement in turbine design ushered in the mega-dam boom in the 1930s. So the Ethiopian dam was being built beginning 2010 after tremendous technical and technological advancements using state-of-the-art equipment and an experienced Italian contractor like Salini. That proves that the technical excuses and counter arguments are political than technical delaying or disruptive tactics.

The equipment used is much more modern and sophisticated than the equipment, architectural designing tools, engineering software available from when the Hoover Dam (1938), Aswan High Dam (1956-1970) or other dams on the Danube, Zambezi, Yangtze and the Ganges were built. Ethiopia had the opportunity to learn lessons from the last century of mega-dam building. Ethiopia clearly knows and understands the concerns of upriver countries and has drawn lessons from the impact that building mega-dams have on downstream countries based on lessons from the Hoover

Dam on the Colorado River flow to Mexico, the Ataturk Dams in Turkey and its impact on Syria and Iraq, China's control over multiple rivers flowing downstream to India, Pakistan, Myanmar, Bangladesh and Vietnam.

The USD 4.8 billion contract was awarded to Salini Costruttori, an Italian Company with good experience and the know-how in dam construction in Ethiopia.

Italy's Cable Manufacturer Tratos Cavi Spa has been awarded a multi-million dollar contract to supply low and high voltage cable to the Grand Ethiopian Renaissance Dam (GERD).

Alstom has signed a 250 euro million contract with Metals and Engineering Corporation (MetEC) to supply turbines and generators for GERD. Alston will supply and supervise the installation of all electromechanical equipment for the plant; including eight 375 MW turbines and eight generators for the first phase. The contract also includes engineering and power plant commissioning. Alston will oversee a programme to develop skills locally and know-how in the area of hydroelectricity. ALSTON has been active in Africa for 80 years and has numerous hydro-electrical projects to its credit across the continent - in Mozambique, Angola, Ghana, South Africa, Uganda and Zambia.

The issue of water loss for Egypt: Cairo's worries and concerns of the years of filling the new dam's 74 billion cubic meters reservoir will cut the river's flow and the surface water evaporation from the huge new lake will then reduce it permanently, are unfounded and addressable with mutual agreement. From the current share of water Egypt receives, it loses about 12 percent of it due to evaporation, while the water is stored in Lake Nasser for 10 months between the flood time and irrigation needs. Ethiopia has a lesser evaporation ration (almost half of Egypt's) and the electrical dam will slow down the rate of what Egypt receives, thus making sure that the water that gets stored in Lake Nasser arrives in storages and thus decreases Egypt's evaporation rate considerably. This will lead to an actual reduction in lost water and an increase in actual water by five percent. Storing the water in Ethiopia before it reaches Egypt will actively lead to an increase in Egypt's water supply. The reservoir, located in the temperate highlands and up to 200 meters deep will experience less evaporation than downstream reservoirs as in Lake Nasser.

In the last 150 years, the lowest recorded flow at Aswan Dam was 42 BCM (1913-1914) and the highest was 150 BCM (1878-1879), whereas the mean annual flow from 1900 to 2004 was 85.3 BCM. The flow has oscillated between 117 BCM to under 50 BCM in the half century 1960 to 2010.

The fluctuation in the flow of watercourses are likely to increase in the 21st century. The Nile River Basin is witnessing a change in rainfall patterns with changes in seasonal periods, and shorter bursts of intense rains that are too rapid for agricultural growth. The dam built by Ethiopia has taken that into account.

Climate change models predict increase or decrease of 15-20 per cent precipitation on an annual basis. However, most models concur that irrespective of the overall annual quantity, erratic patterns of rainfall and concentration over fewer days would affect productivity of agriculture.

It is expected that temperatures across the Nile Basin will increase by 1.5-2.1 per cent by 2050. Almost the entire Nile region may become arid to semi-arid in the next 30-40 years, which will significantly reduce agricultural land. Gradual expansion of arid and semi-arid areas initially surrounding the Nile Basin will eventually be encroaching upon the Basin itself. The continuation of this trend is bound to lead to the narrowing of fertile land. Therefore if Ethiopia, Egypt and Sudan cooperate on the Blue Nile Basin, the dangers of food insecurity, shrinking agricultural land and agricultural productivity could be tackled and the Ethiopian Dam will play a central role. The center of the Blue Nile Basin is the Ethiopian highland and the Blue Nile gorge.

Floods and droughts have caused immense damage to the Nile River Basin. Between 1900 and 2012, there have been almost 140 incidents of floods in the Nile Basin. More than 100 of them occurred in Ethiopia, Sudan, South Sudan, Kenya and Tanzania. During this period, more than 10 million people living in the Nile Basin were affected by floods with around 4,000 casualties. The Ethiopian Dam will definitely and radically reduce the floods for Sudan and Ethiopia.

"Ethiopia: In Defense of Ethiopia's Dam and Its National Interest",16/08/2014, online at: http://allafrica.com/stories/201408180260.html?viewall=1

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### ❖ Egypt, Ethiopia and Sudan Set For Three-Way Talks on Controversial Nile Dam

Sudan is set to host three-way talks with Egypt and Ethiopia over the construction of the Grand Renaissance Dam, according to Egyptian state news agency MENA.

The talks will address the findings of an international study into the human and economic impact of the dam, which is being built on a stretch of the Blue Nile.

Egypt is concerned the project could damage the flow of water from the river Nile. Citing treaties dating back to 1929 and 1959, Cairo says it retains its historic rights over the river.

Those treaties, agreed with the UK and Sudan, gave two-thirds of the Nile's water to Egypt, as well as the right to veto projects that could affect the river.

Egypt has accused its southern neighbour of launching a water war, which could lead to a nationwide water shortage that could lead to crop failures, electricity shortages and political instability.

"It's impossible to undertake a project on this scale without environmental impact studies to assess the consequences for downstream countries," said Mohamed Ghoneim, Egypt's representative to the African Union, as quoted by the UK's Guardian newspaper.

For its part, Ethiopia has pressed ahead with the project regardless of old agreements. Analysts have said Addis Ababa is capitalising on Egypt's relative weakness to push through the dam project.

"These treaties are now obsolete. We are entitled to build the dam," said Alemayehu Tegenu, Ethiopia's minister of water.

The dam project is expected to cost more than $4bn in total. Ethiopian officials have stressed the water will be used to generate electricity rather than irrigate fields, meaning it would eventually reach Egypt.

Egypt's leadership remains unconvinced by those kinds of assurances and will press its concerns in at the meeting set for August 25 and 26.

"Egypt, Ethiopia and Sudan Set For Three-Way Talks on Controversial Nile Dam",18/08/2014, online at: http://www.ibtimes.co.uk/egypt-ethiopia-sudan-set-three-way-talks-controversial-nile-dam-1461657

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### ❖ India Plans to Spend $1 Billion to Clean Waters by 2017

**India** plans to spend 62.4 billion rupees ($1 billion) by 2017 to clean waters in 10,000 canals, lakes and rivers as it seeks to irrigate more land in a nation that runs the world's largest food subsidy program.

**Asia**'s third-biggest economy will be able to irrigate an additional half-million hectares (1.2 million acres) of land because of the plan, Minister for Water Uma Bharti **said** today in Parliament.

Prime Minister **Narendra Modi**'s government will partly fund the projects, which will be implemented by state governments, Bharti said. Of almost 524,000 water bodies used for irrigation in India, the government said about 80,000 aren't operational because of increased usage of groundwater by farmers, lack of maintenance and diversion of land for different uses.

The Indian government has also prepared a plan to build artificial replenishment and rainwater harvesting structures across almost 1 million square kilometers to harness water during the monsoon that accounts for about 70 percent of India's annual rain as well as to improve groundwater levels, the minister said.

Growing population in the second-most populous nation has cut India's water availability to 1,545 cubic meters per person in 2011 from 1,816 cubic meters in 2001, according to the government.

The water spending plan announced today was initially sketched out in 2012.

"India Plans to Spend $1 Billion to Clean Waters by 2017",14/08/2014, online at: http://www.bloomberg.com/news/2014-08-14/india-plans-to-spend-1-billion-to-clean-waters-by-2017.html?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=3ca9b7f9c7-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-3ca9b7f9c7-250657169

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### ❖ Tibet's glaciers at their warmest in 2,000 years: report

(Reuters) - The Tibetan plateau, whose glaciers supply water to hundreds of millions of people in Asia, were warmer over the past 50 years than at any stage in the past two millennia, a Chinese newspaper said, citing an academic report.

Temperatures and humidity are likely to continue to rise throughout this century, causing glaciers to retreat and desertification to spread, according to the report published by the Chinese Academy of Sciences' Institute of Tibetan Plateau Research.

"Over the past 50 years, the rate of temperature rise has been double the average global level," it said, according to the report on the website of Science and Technology Daily, a state-run newspaper.

Glacier retreat could disrupt water supply to several of Asia's main rivers that originate from the plateau, including China's Yellow and Yangtze, India's Brahmaputra, and the Mekong and Salween in Southeast Asia.

In May, Chinese scientists said Tibetan glaciers had shrunk 15 percent - around 8,000 square km (3,100 square miles) - over the past 30 years.

The new report said a combination of climate change and human activity on the plateau was likely to cause an increase in floods and landslides there. However, rising temperatures had also improved the local ecosystem, it said.

The scientists urged the government to work to reduce human impact on the region's fragile environment.

But Beijing is building a series of large hydropower projects there, with construction of several mega-dams expected to start by 2020. China has built thousands of dams in the past few decades in a bid to reduce its reliance on imported fossil fuels.

India, too, is planning a number of hydro plants along the Brahmaputra river - more than 100 proposals are under consideration - as the country strives to boost electricity generation.

"Tibet's glaciers at their warmest in 2,000 years: report",14/08/2014, online at: http://www.reuters.com/article/2014/08/14/us-china-climatechange-idUSKBN0GE09520140814?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=3ca9b7f9c7-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-3ca9b7f9c7-250657169

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### ❖ Humans now strongest driver of glaciers melting, study finds

During the last two decades two thirds of glacial mass loss was due to humans, up from a quarter previously

Melting of glaciers caused by human activity has soared in the past 20 years, a study has shown.

Human influence is now the strongest driver of glacier melting, which has been occurring since the end of the "Little Ice Age" in the mid-19th century, it is claimed.

Between 1851 and 2010, only a quarter of glacial mass loss was due to human-induced climate change, scientists calculated. But during the last two decades of that period the human contribution rose to two thirds.

Lead researcher Dr Ben Barzeion, from the University of Innsbruck in Austria, said: "Typically, it takes glaciers decades or centuries to adjust to climate changes. In the 19th and first half of 20th century we observed that glacier mass loss attributable to human activity is hardly noticeable but since then has steadily increased.

"While we keep factors such as solar variability and volcanic eruptions unchanged, we are able to modify land use changes and greenhouse gas emissions in our models. In our data we find unambiguous evidence of anthropogenic contribution to glacier mass loss."

The researchers, whose findings appear in the journal Science, used climate computer simulations to map glacier changes everywhere in the world outside Antarctica.

A global glacier database called the Randolph Glacier Inventory made the study possible.

The scientists reconstructed the area and volume of each glacier in 1851. Two different simulations then predicted how those glaciers might have retreated since.

One only included natural factors such as solar variability and volcanic eruptions. The other also incorporated human influences such as changes in land use and greenhouse gas emissions.

"Humans now strongest driver of glaciers melting, study finds", 15/08/2014, online at:
http://www.theguardian.com/environment/2014/aug/15/humans-now-strongest-driver-of-glaciers-melting-study-finds?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=b38cac163d-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-b38cac163d-250657169

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## ❖ California Drought Transforms Global Food Market

For more than 70 years, Fred Starrh's family was among the most prominent cotton growers in California's San Joaquin Valley. Then shifting global markets and rising water prices told him that wouldn't work anymore.

So he replaced most of the cotton plants on his farm near Shafter, 120 miles northwest of Los Angeles, and planted almonds, which make more money per acre and are increasingly popular with consumers in **Asia**.

"You can't pay $1,000 an **acre-foot** to grow cotton," said Starrh, 85, crouching to inspect a drip irrigator gently gurgling under an almond tree.

Such crop switching is one sign of a sweeping transformation going on in California -- the nation's biggest agricultural state by value -- driven by a three-year drought that climate scientists say is a glimpse of a drier future. The result will affect everything from the price of milk in **China** to the source of cherries eaten by Americans. It has already inflamed competition for water between farmers and homeowners.

Growers have adapted to the record-low rainfall by installing high-technology irrigation systems, watering with treated municipal wastewater and even recycling waste from the processing of pomegranates to feed dairy cows. Some are taking land out of production altogether, bulldozing withered orange trees and leaving hundreds of thousands of acres unplanted.

"There will be some definite changes, probably structural changes, to the entire industry" as drought persists, said American Farm Bureau Federation President Bob Stallman. "Farmers have made changes. They've shifted. This is what farmers do."

**Commodity Crops**

In the long term, **California** will probably move away from commodity crops produced in bulk elsewhere to high-value products that make more money for the water used, said Richard Howitt, a farm economist at the University of California at Davis. The state still has advantages in almonds, pistachios and wine grapes, and its location means it will always be well-situated to export what can be profitably grown.

**Turning the Tables: The Global Food Challenge**

That may mean less farmland in production as growers abandon corn and cotton because of the high cost of water. Corn acreage in California has dropped 34 percent from last year, and wheat is down 53 percent, according to the USDA.

Cotton planting, Fred Starrh's one-time mainstay, has fallen 60 percent over the decade, while almonds are up by more than half.

**'Big Deal'**

On its own, California would be the world's ninth-largest agricultural economy, according to a **University of California** at Davis study. Shifts in its production reverberate globally, said Dan Sumner, another agricultural economist at the school.

"It's a really big deal," Sumner said. "Some crops simply grow better here than anyplace else, and our location gives us access to markets you don't have elsewhere."

The success of California agriculture was built in large part on advances in irrigation that allowed the state to expand beyond wheat, which flourishes in dry climates. It's now the U.S.'s top dairy producer and grows half the country's fruits, vegetables and nuts.

"Water has allowed us to grow more valuable crops," Sumner said. "Now, we have fruits and vegetables and **North Dakota** grows our wheat. Without irrigation, we'd be North Dakota."

An estimated 82 percent of California is experiencing extreme drought, according to the U.S. Drought Monitor. Agriculture has been hard hit as it consumes about four-fifths of the water that isn't set aside for environmental preservation. Some farmers are paying as much as 10 times more for water than what it cost before the drought.

**Farmers Adapt**

Another dry year in 2015 is a strong possibility, according to a study by the University of California at Davis released last month. The same study pegs drought-related farm losses at $1.5 billion, with 17,100 jobs lost statewide.

Groups such as the California Citrus Mutual and California Farm Bureau Federation have been calling for bigger allocations from the state's watersheds for agriculture, asking the state to add storage capacity and ease environmental regulations that set aside water to preserve endangered species.

California Governor **Jerry Brown** last week called for a $6 billion "no frills" bond measure for this November's election to boost water storage, a key demand of farmers that's smaller than what some groups want.

That puts the farmers on a collision course with environmentalists and urban advocates who say some choices -- such as a switch to almonds -- could worsen the scarcity.

Almond Crop

California grows four-fifths of the world's almonds, much of it for overseas markets. That has pushed the price up to more than $3 a pound, a record that has encouraged farmers to divert water from other crops.

Almonds use enough water to supply 75 percent of the state's population, according to Carolee Krieger, president and executive director of the California Water Impact Network, which supports bigger supplies for cities. Much of the crop is exported, meaning it isn't even feeding Californians, she said.

"Farmers should be profitable, but it can't come at the expense of urban water ratepayers," she said.

The U.S. Interior Department's Bureau of Reclamation, which supplies water to a third of the state's irrigated farmland, cut off California water distribution to some areas, while leaving others with 75 percent or less of their normal allocation.

**Bulldozed Branches**

Shawn Stevenson, who grows 1,200 acres of orange and olive trees outside Fresno, is in a zero-allocation area.

Unable to obtain affordable water for his trees, he hired a bulldozer to uproot about 400 acres of orange trees. He called his farm the "canary in the **coal mine**" for California agriculture, part of the 500,000 acres being abandoned this year, according to the University of California at Davis.

"We're going to deliver 25 percent of our volume this year," Stevenson said over the crunch of bulldozed branches. "That impacts the packing house, the people who sell the fruit, the people that we buy pesticides and fertilizers from."

"If this persists in the next year, the devastation we will see here and across the state will be biblical."

Faced with chronic dryness, farmers have been figuring out ways to adapt. Starrh's drip-irrigation system was pioneered in **Israel** and is now widely employed across California, cutting water use by supplying plants with smaller, targeted amounts.

**Pepper Plants**

"Farmers have done a remarkable job, scrambling around to get every piece of water they can," Sumner, the University of California economist, said. "They've taken water out of rice, out of alfalfa and moved it into onions and carrots and kept the trees and vines alive."

Will Terry grows peppers **and strawberries** in Ventura County, a region 60 miles west of **Los Angeles** that produces about $700 million of the fruit annually. The farm he runs with his father now uses about two-thirds of the water it used 20 years ago.

"People will try to grow the same things, but they'll have to change how they do it," said Terry as workers draped string across fields with which to hold up pepper plants.

Brad Scott, a dairy producer near Riverside in the Los Angeles suburbs, supplies his farm with treated municipal wastewater. The chlorine makes his ranch smell a bit like a swimming pool, but it has allowed his property to disconnect from the city water supply.

The disruption is worthwhile: Dairy prices reached an all-time high of $24.31 per hundred pound in April as export demand pushed dry-milk shipments to a record.

**Spraying Animals**

The drought has put special pressure on ranchers raising livestock, drying out pasture land and making it more costly to cool the herd by spraying the animals with water.

Brian Medeiros, a 26-year-old dairyman near Hanford, about 30 miles south of Fresno, is replacing the fields of corn and wheat he grows to feed his cows with sorghum and triticale, a heartier wheat and rye hybrid better suited for drought.

Medeiros drives past a shed containing almond hulls and distillers' dried grains -- the byproduct of ethanol and brewery production -- and citrus pulp, all of which he buys from nearby vendors to feed his cows. Leftover pomegranate has been a herd mainstay, though less so as the consumer craze for anti-oxidants has faded, reducing the number of suppliers.

He's also working with an engineer to create a cow-motion sensor. The system, deployed in his animal stalls, would change how animals are sprayed with water to keep them cool, ensuring that water only sprays while a cow is present.

**Fewer Cherries**

"You have to look at everything," Medeiros said between conversations in Portuguese with his father, who founded the farm, on his mobile phone.

A warmer climate is forcing Cindy Lashbrook to phase out cherries on the organic farm where she also grows walnuts, blueberries and other fruits and tree nuts near Merced, about 100 miles southeast of **San Francisco**.

Her cherries require 1,000 hours of temperatures under 45 degrees (7 degrees Celsius) between November and February, an amount her farm hasn't seen for several years. "We don't get the fog like we used to."

Howitt, of the University of California, said the drought means the state's farmers will have to permanently reduce water usage.

"California needs to rebalance its agricultural portfolio in response to this drought," Howitt said. "You will see more fallowing of land. We have to reduce our water footprint."

That means drip-fed trees for Starrh, a cotton-grower since when his family arrived on 30 acres in 1936 who now focuses on nuts.

And solar panels.

The Starrhs are leasing 480 acres to a sustainable-energy company on land that may never be watered again.

"It was good land for production," he said. "But reality dictates."

"California Drought Transforms Global Food Market", 12/08/2014, online at: http://www.bloomberg.com/news/2014-08-11/california-drought-transforms-global-food-market.html?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=5593ef9c6b-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-5593ef9c6b-250657169

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