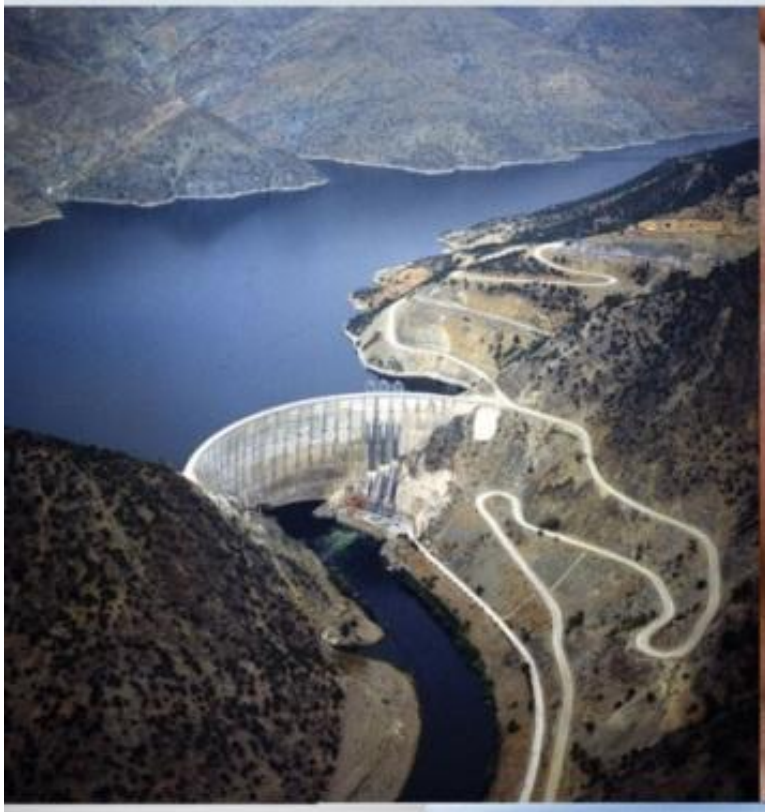


ORSAM WATER BULLETIN

Weekly Bulletin by ORSAM Water Research Programme

Events-News-Politics-Projects-Environment-ClimateChange-Neighbourhoods-Cooperation-Disputes-Scarcity and more





Issue 190

ORSAM WATER BULLETIN

21 July -27 July 2014

- Using Water as a Weapon of War
- ISIS gains highlight 'aggressive' use of water as weapon of war
- ISIS militants use water as weapon of war in Iraq
- ISIS Cutting off Water Supply to Christians, Kurds in Regions They do not Control
- Thirsting for Change: Israel's War on Gaza's Water Supply
- Lack of Water Unseen Problem in Gaza Conflict
- Israel wants Palestine's water and gas
- Oxfam warns food, water running low in Gaza
- Rula Jebreal: 90% of people in Gaza 'don't have access even to water'
- New water balance calculation for the Dead Sea
- Israel's secretive water canals to ignite war with Lebanon
- Food Insecurity a New Threat for Lebanon's Syrian Refugees
- Satellite data measures Nile water for region security
- Ethiopia Prioritizes Equitability to Nile Water Use – Mwie
- China to roll out seven pilot markets for trading water rights
- India bids to reassert influence in Nepal with power pact
- Thai Rice Harvest Seen Dropping on Drought, Subsidy Lapse
- Canada's Record Rains Cut Wheat Acreage to Three-Year Low

Süleyman Nazif Sokak No: 12-B Çankaya -Ankara/TURKEY
Tel: +90 (312) 430 26 09 Fax: +90 (312) 430 39 48 orsam@orsam.org.tr

❖ Using Water as a Weapon of War

In a war, anything can be a weapon. In a particularly ruthless war, such as the conflict that has been raging in Syria for more than three years, those weapons are often turned against civilians, making any semblance of normal life impossible. Such is the case, experts say, with the way the nation's water supply is being manipulated to inflict suffering on the population.

According to an article posted by Chatham House, a London-based independent policy institute, water infrastructure has been targeted by both sides in the conflict, leading to crippling disruptions in water supply over the last several months in cities such as Aleppo, Homs and Hama. The disabling of water treatment plants has led to a reported increase in waterborne diseases such as typhoid.

According to Chatham House researcher and fellow Nouar Shamout, the war has only worsened an already complicated and precarious water situation. ISIS, the Islamist rebel group that has seized control of many parts of Syria and northern Iraq, controls key parts of the water infrastructure in the regionally crucial Euphrates River system, including Al-Raqqa dam, which supplies one-fifth of Syria's electricity and controls irrigation flows downstream.

Shamout writes:

The Euphrates River, which provides 65 per cent of the country's water needs, is also experiencing a dangerous decrease in its flow rates. This is likely to be due to a combination of factors: decades of poor water management, current neglect of water infrastructure on the Euphrates, and the absence of any coordination between Syria and upstream Turkey regarding the river flow. As a result, in late May, the river dried up downstream of Al-Raqqa city, depriving many downstream towns of water. The water level of Al-Assad Lake — Syria's largest reservoir, which provides irrigation for some 500 square miles of agricultural land and all of Aleppo's drinking water — has dropped by six meters since ISIS took control in January. If the lake loses one more meter the water system will stop working. This will leave more than four million inhabitants without access to safe water. This could result in a humanitarian catastrophe that would overwhelm agencies on the ground.

As Peter Gleick, president of the California-based Pacific Institute, wrote in the Huffington Post back in May, the region's troubled water supply has been one of the causes of the current conflict. Failure to respond comprehensively to a devastating drought that stretched from 2006 to 2011, wrote Gleick,

left Syria vulnerable to destabilization. "The drastic decrease in water availability, water mismanagement, agricultural failures, and related economic deterioration contributed to Syria's population dislocations and the migration of rural communities to nearby cities," he wrote. "These factors further contributed to urban unemployment, economic dislocations, food insecurity for more than a million people, and subsequent social unrest."

In February of 2013, a UNICEF report PDF said that the situation was already critical, with refugees in some parts of Syria facing severely curtailed access to water and sanitation, with as many as 70 people using a single toilet. The situation for Syria's civilians has only gotten worse since then.

Now, ISIS is threatening water infrastructure in Iraq as well. "Rebel forces are targeting water installations to cut off supplies to the largely Shia south of Iraq," Matthew Machowski, a researcher at Queen Mary University of London, told the Guardian earlier this month. "It is already being used as an instrument of war by all sides. One could claim that controlling water resources in Iraq is even more important than controlling the oil refineries, especially in summer."

A failure to respond to the ongoing water crisis will further destabilize the region, many experts predict. And yet so far, millions of residents of Syria have been left at the mercy of warring factions with no scruples about leveraging this most vital natural resource to achieve their goals.

Chatham House's Shamout warns that "both Syria's regime and opposition groups are in a state of denial" about the severity of the crisis. The lack of water for irrigation, he predicts, will lead to dangerous food shortages as the wheat harvest is threatened by lack of water.

Shamout calls on the United Nations and international aid agencies to make water a priority, for drinking, sanitation and irrigation. Failure to do so, he writes, will put Syria at risk for "an impending tragedy." A tragedy perhaps on an even greater scale than the ones the nation has already endured.

"Using Water as a Weapon of War", 21/07/2014, online at: http://nextcity.org/daily/entry/water-war-weapon-syria-cities

BACK TO TOP

❖ ISIS gains highlight 'aggressive' use of water as weapon of war

BEIRUT: Militants from ISIS now control or threaten key facilities on the Euphrates and Tigris rivers, generating fears that the Al-Qaeda splinter group could turn off the taps to the Shiite south of Iraq, sparking a massive humanitarian crisis.Last month's ISIS-led offensive across Iraq saw it overrun cities and battle for oil refineries as the national army melted away, but it has also been waging a war for water, trying to wrest control over rivers, dams and desalination plants in a bid to solidify its territorial gains.

Control of water is seen as key to the viability of the fledgling caliphate declared by ISIS leader Abu Bakr al-Baghdadi. Without water, seasonal droughts cannot be managed, electricity cannot be generated, proper sanitation practices are near impossible and the local economy grinds to a virtual halt.

"When it comes to creating an Islamic state, it is not just about the control of geographic areas in Syria and Iraq. In order to form a viable state, one must control the state's most vital infrastructure, which in Iraq's case is water and oil," said Matthew Machowski, a research fellow at Queen Mary University.

In Mosul, the first city ISIS captured, residents fled when the water and electricity were cut off but returned a few days later when the jihadist group was able to switch supplies back on, in a bid to engender support among the local population.

Iraq's 32 million people are entirely dependent on water flowing down from two great rivers in Turkey, the Euphrates and the Tigris. Where those waterways enter Iraq in the north, ISIS holds key dams and surrounding areas, leaving Shiite-majority southern Iraq vulnerable to the use of water as a strategic weapon.

In April, ISIS seized control of the Fallujah dam and its fighters released a wall of water from behind the barrage, destroying cropland 160 kilometers downstream and leaving millions of people without water in the predominately Shiite cities of Karbala, Najaf and Babil, while flooding areas as far away as Abu Ghraib.

"The intent behind the water release was to use water aggressively as a tool of destruction, targeting populations who live father south," said Russell Sticklor, co-author of Water Challenges and Cooperative Response in the Middle East and North Africa.

" ISIS is well aware of the strategic importance of controlling water access ... Control of this water infrastructure allows ISIS to control the faucet, and decide how much – or how little – water is released downstream. This is of great strategic importance because southern Iraq, the Shiite heartlands, needs water from the Tigris and the Euphrates to survive," he added. "They are in a very vulnerable position,"

U.N. Secretary-General Ban Ki-moon last week described the use of water as a weapon in Fallujah a "dangerous trend."

Like Fallujah, fears abound that militants could employ a similar tactic at the Samarra barrage, overtaken recently in clashes around the contested holy city, the site of bloody sectarian violence in 2007. The barrage is designed to control the flow of water from the country's biggest lake, Tharthar, and generate hydroelectricity.

With these key dams under its belt, ISIS appears to have turned its focus to Haditha, at the heart of Iraq's water infrastructure and responsible for 30 percent of the country's electricity, particularly to Baghdad. Positioned on a main artery to the capital, its capture would represent "a huge symbolic and practical victory," said Sticklor. Government troops are actively defending Haditha, alarmed that an ISIS victory there would pave a virtually clear the road to the capital.

Highlighting the importance of Haditha, the dam became one of the first areas secured by U.S. special forces in the 2003 invasion, amid concerns in Washington that Saddam Hussein would flood surrounding areas, explained Nouar Shamout, researcher at Chatham House.

Haditha, along with Mosul dam, provides more than 75 percent of Iraq's electrical power. Although the city of Mosul is firmly in ISIS hands, the dam further north is controlled by Kurdish forces, the peshmerga.

Last week, the peshmerga overran several oil fields around Kirkuk, expelling government staff, a move that could add 250,000 barrels a day of the Kurdish Regional Government's oil production.

Control of Mosul dam and the oil fields bring the Kurdish dream of establishing an independent state closer to reality, said Machowski.

" Mosul dam is absolutely essential to water security for Kurdistan. Securing the dam and oil installations puts the Kurds in a situation where independence becomes a fait accompli," he said.

With Kurds and ISIS both siphoning off key territory and resources, "the question of water is as serious as it gets, it really is an existential issue for Iraq," said Michael Stephens, Deputy Director of Royal United Services Institute Qatar, a British security think-tank.

Although ISIS has swept through territory holding vital water installations with apparent ease, questions have emerged over whether its fighters' capacity for brutal acts of violence can be matched by the technical know-how required to properly manage infrastructure and keep state facilities running smoothly.

Across the border in Syria, water in the ISIS-held Lake Assad is running dangerously low. The 85 kilometer long lake is Syria's largest and until recently it held more than 14.2 billion cubic meters of water. According to the anti-regime activist group the Raqqa Media Center, water levels have

dropped by 1.6 billion cubic meters in the past few weeks, forcing two-thirds of the lake's electricity-generating turbines to stop working.

The dramatic, unprecedented drop in water levels has left nearly three million people in Aleppo and over a million people in Raqqa without potable water, Shamout said.

"Studying this case shows that ISIS does not have a strong water management policy ... Running a local water supply network is totally different from running a huge and interconnected water structures such as dams."

Apparently aware it lacks specialized knowledge in engineering and hydrology, the group negotiated to retain staff and keep the dam running at the Tabqa dam outside Raqqa.

The move appears shrewd. ISIS can retain the support of locals while still exerting influence over water distribution and receiving a steady stream of revenue to fund its tentative state – it echoes the group's earlier tactic of allowing the sale of oil and oil derivatives back to the Damascus government from fields it had captured.

" ISIS know water, and water access, can be wielded as a powerful psychological weapon," Sticklor said. "The mere idea that your water could be cut off is deeply unsettling ... In the end no one can be certain of what the region's future holds. But if Iraq is descending into a civil war, water is guaranteed to emerge as a major component of this conflict."

"ISIS gains highlight 'aggressive' use of water as weapon of war", 21/07/2014, online at: http://www.dailystar.com.lb/News/Middle-East/2014/Jul-21/264554-isis-gains-highlight-aggressive-use-of-water-as-weapon-of-war.ashx#axzz394gc7pq3

BACK TO TOP

❖ ISIS militants use water as weapon of war in Iraq

Militants from ISIS now control or threaten key facilities on the Euphrates and Tigris rivers, generating fears that the Al-Qaeda splinter group could turn off the taps to the Shiite south of Iraq, sparking a massive humanitarian crisis. Last month's ISIS-led offensive across Iraq saw it overrun cities and battle for oil refineries as the national army melted away, but it has also been waging a war for water, trying to wrest control over rivers, dams and desalination plants in a bid to solidify its territorial gains.

Control of water is seen as key to the viability of the fledgling caliphate declared by ISIS leader Abu Bakr al-Baghdadi. Without water, seasonal droughts cannot be managed, electricity cannot be generated, proper sanitation practices are near impossible and the local economy grinds to a virtual halt.

"When it comes to creating an Islamic state, it is not just about the control of geographic areas in Syria and Iraq. In order to form a viable state, one must control the state's most vital infrastructure, which in Iraq's case is water and oil," said Matthew Machowski, a research fellow at Queen Mary University.

In Mosul, the first city ISIS captured, residents fled when the water and electricity were cut off but returned a few days later when the jihadist group was able to switch supplies back on, in a bid toengender support among the local population.

Iraq's 32 million people are entirely dependent on water flowing down from two great rivers in Turkey, the Euphrates and the Tigris. Where those waterways enter Iraq in the north, ISIS holds key dams and surrounding areas, leaving Shiite-majority southern Iraq vulnerable to the use of water as a strategic weapon.

In April, ISIS seized control of the Fallujah dam and its fighters released a wall of water from behind the barrage, destroying cropland 160 kilometers downstream and leaving millions of people without water in the predominately Shiite cities of Karbala, Najaf and Babil, while flooding areas as far away as Abu Ghraib.

Süleyman Nazif Sokak No: 12-B Çankaya -Ankara/TURKEY
Tel: +90 (312) 430 26 09 Fax: +90 (312) 430 39 48 orsam@orsam.org.tr

"The intent behind the water release was to use water aggressively as a tool of destruction, targeting populations who live father south," said Russell Sticklor, co-author of Water Challenges and Cooperative Response in the Middle East and North Africa.

" ISIS is well aware of the strategic importance of controlling water access ... Control of this water infrastructure allows ISIS to control the faucet, and decide how much – or how little – water is released downstream. This is of great strategic importance because southern Iraq, the Shiite heartlands, needs water from the Tigris and the Euphrates to survive," he added. "They are in a very vulnerable position,"

UN Secretary-General Ban Ki-moon last week described the use of water as a weapon in Fallujah a "dangerous trend."

Like Fallujah, fears abound that militants could employ a similar tactic at the Samarra barrage, overtaken recently in clashes around the contested holy city, the site of bloody sectarian violence in 2007. The barrage is designed to control the flow of water from the country's biggest lake, Tharthar, and generate hydroelectricity.

With these key dams under its belt, ISIS appears to have turned its focus to Haditha, at the heart of Iraq's water infrastructure and responsible for 30 percent of the country's electricity, particularly to Baghdad. Positioned on a main artery to the capital, its capture would represent "a huge symbolic and practical victory," said Sticklor. Government troops are actively defending Haditha, alarmed that an ISIS victory there would pave a virtually clear the road to the capital.

Highlighting the importance of Haditha, the dam became one of the first areas secured by U.S. special forces in the 2003 invasion, amid concerns in Washington that Saddam Hussein would flood surrounding areas, explained Nouar Shamout, researcher at Chatham House.

Haditha, along with Mosul dam, provides more than 75 percent of Iraq's electrical power. Although the city of Mosul is firmly in ISIS hands, the dam further north is controlled by Kurdish forces, the peshmerga.

Last week, the peshmerga overran several oil fields around Kirkuk, expelling government staff, a move that could add 250,000 barrels a day of the Kurdish Regional Government's oil production.

Control of Mosul dam and the oil fields bring the Kurdish dream of establishing an independent state closer to reality, said Machowski.

" Mosul dam is absolutely essential to water security for Kurdistan. Securing the dam and oil installations puts the Kurds in a situation where independence becomes a fait accompli," he said.

With Kurds and ISIS both siphoning off key territory and resources, "the question of water is as serious as it gets, it really is an existential issue for Iraq," said Michael Stephens, Deputy Director of Royal United Services Institute Qatar, a British security think-tank.

Although ISIS has swept through territory holding vital water installations with apparent ease, questions have emerged over whether its fighters' capacity for brutal acts of violence can be matched by the technical know-how required to properly manage infrastructure and keep state facilities running smoothly.

Across the border in Syria, water in the ISIS-held Lake Assad is running dangerously low. The 85 kilometer long lake is Syria's largest and until recently it held more than 14.2 billion cubic meters of water. According to the anti-regime activist group the Raqqa Media Center, water levels have dropped by 1.6 billion cubic meters in the past few weeks, forcing two-thirds of the lake's electricity-generating turbines to stop working.

The dramatic, unprecedented drop in water levels has left nearly three million people in Aleppo and over a million people in Raqqa without potable water, Shamout said.

"Studying this case shows that ISIS does not have a strong water management policy ... Running a local water supply network is totally different from running a huge and interconnected water structures such as dams."

Apparently aware it lacks specialized knowledge in engineering and hydrology, the group negotiated to retain staff and keep the dam running at the Tabqa dam outside Raqqa.

The move appears shrewd. ISIS can retain the support of locals while still exerting influence over water distribution and receiving a steady stream of revenue to fund its tentative state – it echoes the

group's earlier tactic of allowing the sale of oil and oil derivatives back to the Damascus government from fields it had captured.

" ISIS know water, and water access, can be wielded as a powerful psychological weapon," Sticklor said. "The mere idea that your water could be cut off is deeply unsettling ... In the end no one can be certain of what the region's future holds. But if Iraq is descending into a civil war, water is guaranteed to emerge as a major component of this conflict.

"ISIS militants use water as weapon of war in Iraq", 21/07/2014, online at: http://www.albawaba.com/news/isis-water-iraq-591811

BACK TO TOP

❖ ISIS Cutting off Water Supply to Christians, Kurds in Regions They do not Control

The Islamic State-- formerly Islamic State of Iraq and al-Sham (ISIS)-- has previously used water as a destructive tool to destroy crops and dams in Shi'ite territory. Now, ISIS is attempting to deprive major Christian strongholds of water through their control of pipe systems.

According to Bloomberg Businessweek, the city most affected by ISIS's new campaign to deny water to as many Christians and Shi'ites in Iraq as possible is the city of Qaraqosh, currently under control of Kurdish Peshmerga forces and, thus, impenetrable to the terrorist jihadist group. Their only current connection to Qaraqosh is a water pipeline from the Tigris River, and ISIS has worked diligently to exploit this one tie by cutting off the water supply from the historic river.

As Bloomberg's Jason Motlagh explains, the tactic has worked, as it is forcing Kurdish administrators in the town to import the water at extremely high prices and begin to dig wells to help better distribute the water. The wells require weeks and months of work to complete, however, and water has to travel 15 miles from other Kurdish controlled areas to reach Qaraqosh. Residents are now paying $10 a day for emergency water tanks, a fortune to many who live with limited means in the city.

Iraq's water supply comes mainly from two rivers-- the Tigris and Euphrates, between which the ancient civilization of Mesopotamia arose. With ISIS controlling the Tigris water supply, any influence on water from the Euphrates could be pivotal to eradicating Christians and Shi'ites from Iraq. Shi'ites in southern Iraq are in particular danger as, without water from either river being irrigated down, they have no other source of water immediately available.

Lebanon's Daily Star reports that ISIS is keenly aware of this, and has made moves to attempt to control the Euphrates water supply. It threatens key pipelines south to the Shi'ite populations, creating critical problems for the area should they capture these supplies: "seasonal droughts cannot be managed, electricity cannot be generated, proper sanitation practices are near impossible and the local economy grinds to a virtual halt."

ISIS began to use water as a weapon of war in a very different way. When it took control of the Fallujah dam, for example, the jihadists closed off the water supply to the south Euphrates using the dam, then reopened it-- flooding major areas and wasting potable water. “The intent behind the water

release was to use water aggressively as a tool of destruction, targeting populations who live father south," said Russell Sticklor, co-author of Water Challenges and Cooperative Response in the Middle East and North Africa, to the Daily Star. Now, ISIS is actively trying to deprive areas of water-- not surfeit them with it-- in an attempt to starve out minority groups it opposes.

"ISIS Cutting off Water Supply to Christians, Kurds in Regions They do not Control", 22/07/2014, online at: http://www.breitbart.com/Big-Peace/2014/07/22/ISIS-Cutting-off-Water-Supply-to-Christians-Kurds-in-Regions-They-Do-Not-Control

BACK TO TOP

❖ Thirsting for Change: Israel's War on Gaza's Water Supply

A father visiting his son in the hospital might otherwise be a picturesque moment. In any other country it could be a time for parental bonding; an opportunity for family members to care for those most precious to them. Yet recently in Gaza, after repeatedly and desperately imploring the shattered corpse of his four-year old son to "wake up", the young father, Salman Abu Namous, was ushered from the hospital room in a state of near collapse.

Such images may easily evoke words like "war crime" in the minds of many onlookers. United Nations figures indicate that from the death toll after just days of Israeli bombardment, eighty one percent of casualties were civilians, twenty one percent of them children.

In ongoing raids, the Israeli air force have also destroyed water wells and lengths of pipeline, in the process, according to the International Committee of the Red Cross (ICRC), leaving "hundreds of thousands" of Gazans without adequate hydration.

The above constitutes a clear violation of article 54 of Additional Protocol One to the 1949 Geneva Conventions. In prose that leaves little room for doubt, the actual text of the article states that it is "prohibited to attack, destroy, remove or render useless objects indispensable to the survival of the civilian population" with "drinking water installations and supplies and irrigation works" coming in for special mention.

In a press release distributed on July 15th, the ICRC cited "repeated bombing" that had "devastating Gaza's fragile water infrastructure." A variety of other civilian installations were rendered inoperable due to the mounting water shortages, with schools, hospitals and refugee camps bearing the brunt of the hardship. UN figures indicate that a third of the population were left unsupplied.

Guillaume Pierrehumbert, a water and sanitation expert with the ICRC, cited the issues posed by a badly damaged sewer system, with water contamination bringing with it the mounting risk of disease. The deaths of several maintenance technicians also severely limited repair work.

"Water is a big issue," said Christian Cardon, head of the ICRC operation in Gaza. "To give you an example [of the crisis], the ICRC was recently in a refugee camp north of Gaza city, where some

seventy thousand people live. Yet it's now [since July 12th] been seven days since these people had access to water."

The Al-Shati refugee camp mentioned above contains a large number of children, with some thirty five percent of occupants either being pregnant mothers or infants under the age of six months. Camp residents are now thought to be drawing water from wells with an excessively high saline content. In addition, repair work to the local water supply is dependent on negotiations between the ICRC and the IDF to ensure workers can operate without coming under fire.

"Water has been a critical problem in Gaza for some time," said Sean Maguire, the Head of Communications and spokesman for the ICRC in Britain and Ireland. "Gaza actually gets much of its water from one single aquifer whose usable levels have been dropping dramatically as a result of over-use and aging equipment."

Israeli media has a different view. In an article for Arutz Sheva, Tova Durin scrutinizes ICRC findings, making the claim that "Israel has continued to send humanitarian aid into Gaza throughout the operation, and continues to provide the bulk of Gaza's water, electricity, gas, and communications infrastructure – despite the fact that Hamas has fired over 8,500 rockets on Israeli civilians since Israel withdrew from Gaza in 2005."

Neill Kirrane is a policy adviser with the Middle East office of the Diakonia International Humanitarian Law Resource Center. "In many respects Israeli society is shifting politically to the right," he said. "There is this idea growing that the Palestinians have never had it any better, and a standard view from the IDF is that there are no issues with bringing anything in and out of Gaza and there is no humanitarian crisis. It gets to the point that there's a notion [in Israel] that people in Gaza are building mansions and swimming pools and so there's a problem when it comes to appreciating reality and good journalism."

Damage to Gaza's civilian infrastructure is not a new phenomenon. In 2008-2009's Operation Cast Lead, IDF actions again took a toll on Palestinian food and agriculture, with the Red Cross citing the destruction of "thousands of citrus, olive and palm groves" alongside "irrigation systems, wells and greenhouses." Gaza's water supply has still not fully recovered, with some ninety percent of the

supply being unfit for consumption, forcing many residents to rely on expensive bottled water brought in from elsewhere.

"The Gaza Strip was absolutely decimated during [the 2008-2009 Israeli Operation] Cast Lead," said Kirrane. "Aid agencies that do work there have been playing catch-up ever since when it comes to restoring some sense of normality. It's not the case that before this current conflict Gaza was starting from point zero in terms of its water supply; it was already in a terrible state and was very much inadequate for the population's needs."

Targeting Water

Despite playing a sizable part in the original drafting of the two Additional Protocols to the Geneva Convention, Israel opted out of signing them. Yet despite not signing the protocols Israel may yet still be bound by them. "Israel is not actually the only country to not sign the protocol," argues Sean Maguire of the ICRC. "The USA, for instance, did not sign, but there are legal boundaries that all nations should be abiding by in a conflict zone that prohibit the targeting of civilian objects."

Such an argument is reinforced by the fact that since the entry of the additional protocols in 1977, a great many nations have ascribed to them, in the process arguably leading to their universal validity as part of international customary law.

In a 2011 Policy Paper for the Israel Democracy Institute, legal researchers Ruth Lapidot, Yuval Shany and Ido Rosenzweig discuss Israel’s opting out of the protocols. Stating that "if it turns out that the provisions of the protocols, to which Israel objected, have become international customary law over the years, the decision not to join the protocols will have limited practical effect, because such provisions bind Israel in any event."

So why the controversy? For one, it may have been the case that the heart of Israel's reticence to join the protocols stemmed from articles involving the extension of prisoner of war status to combatants not under the control of a recognized state party. Prior to Palestine's ascension to statehood last year, this would have included armed Palestinians that the IDF may treat as criminals rather than legitimate soldiers.

Yet if it remains incumbent upon Israel to abide by established customary law in regards to civilian objects, it would seem that they are also called upon to recognize the additional protocols regarding destroying civilian access to water. What constitutes a civilian object is defined in Article 52 of Additional Protocol One as "all objects which are not military objectives" or currently occupied and in use by armed units.

In this respect, a claim that the treatment plants, fresh water wells and sewage lines recently destroyed by IDF air attack actually constituted a military objective seems difficult to comprehend. Their nature, best described by Article 54 as "objects indispensable to the survival of the civilian population" seems well grounded.

But if the above is to be taken seriously, it shows that it is possible for a civilian building to lose its status as a civilian object if utilized for military purposes. Indeed, according to Diakonia, "civilian objects only lose their civilian status if they are making an effective contribution to military action. Examples of this include storing weapons or launching attacks."

But is this the case now with Gaza's water infrastructure? Neill Kirrane thinks not. "Attacks on water supplies are legally absolutely prohibited," he said. "Water supplies and infrastructure cannot be used militarily unlike a hospital or other originally civilian building and so there is just no excuse for targeting them."

Yet where lies the solution? Neill believes the key lies with the full implementation of the law: "Respect for the Geneva Conventions isn't really being addressed in this conflict. Both Israel and Hamas need to start taking the law seriously. If guilty parties had been held to account in 2009 at the end of Cast Lead we wouldn't be in this situation today. And if a new approach in regards to the law doesn't happen then I don't see how, even if a cease fire comes about, we won't simply end up in this very same situation at a later date."

"There was an issue with the first attempt at a cease fire, which fell through since Hamas claimed they had not even been consulted," explains Neill. "But it's also a reality that people in Gaza are saying that we do not want to just go back to the status quo - massive unemployment, undrinkable water, real restrictions on who can get in and out or what can be brought in. They want the siege

lifted, and that's something the European Union, the United Nations, in fact the whole international community is looking for."

"Thirsting for Change: Israel's War on Gaza's Water Supply",25/07/2014, online at: http://www.towardfreedom.com/37-archives/middle-east/3613-thirsting-for-change-israel-s-war-on-gaza-s-water-supply

BACK TO TOP

❖ Lack of Water Unseen Problem in Gaza Conflict

With the 12-hour truce in place between Israel and Hamas, aid agencies are using the break in hostilities to see to some of the humanitarian problems affecting Gaza. Primarily amongst these are a lack of clean drinking water.

The International Red Cross already have teams on the ground to try to help with the problems, which include emergency repairs to sanitation systems. These repairs will help stop the sewage contaminating the drinking water and creating a serious risk of disease. And unless conditions are improved, around 90,000 are facing serious problems in light of the soaring temperatures in the region.

Truce

The truce came into effect at 8am local time and will last for 12 hours for humanitarian purposes, though Israel have stated they will continue to look for Hamas underground tunnels during this time. Since the conflict began on 8th July 38 Israelis have been killed and over 870 Palestinians, many of whom have been civilians.

Just last night, Israeli strikes killed 19 Palestinians while two Israeli soldiers were also killed. Foreign ministers from the US, UK, Qatar and Turkey are meeting in France today to try to negotiate a longer truce.

Action

As well as the work on the sewage and water systems, other repairs will be attempted during the truce including to electricity supplies and banks are planning to open across Gaza. Minutes after the truce came into force, small crowds of people could be seen on the streets around the territory.

US Secretary of State John Kerry said he was confident of a longer ceasefire, despite the Israelis rejecting the proposal. Even after the truce was announced, Israeli Defence Minister Moshe Yaalon stated that ground operations in Gaza would be 'broadened significantly' in the near future.

Hamas also stated that that they would not agree to a long-term truce unless it included an end to the blockade of Gaza by the Israeli.

Spreading problems

Clashes have now spread to the West Bank with protests leaving five Palestinians dead on Friday. They had been taking part in a 'Day of Rage' protesting against the Israeli operations in Gaza.

Meanwhile the Iron Dome defence system operated by the Israeli military said they had intercepted several rockets fired by Hamas. Later statements added that Friday had seen two Israeli soldiers killed in the attacks. The rocket firing was the stated reason for the start of the military campaign earlier in the month. It has since expanded to include the locating and destroying of Hamas tunnels dug to infiltrate Israel.

Underground

The tunnels under Gaza started out over a decade ago when they were used to smuggle weapons from Egypt without the Israeli Defence Forces being aware. Soon, civilian goods were also being imported through them and once the Israeli withdrew from Gaza, the number of tunnels quickly increased. Taxes imposed by Hamas were a major source of revenue but the Muslim Brotherhood's taking of power in Egypt saw an end to this and is said to be one of the major causes of the present economic crisis in Gaza.

"Lack of Water Unseen Problem in Gaza Conflict", 26/07/2014, online at: http://www.newschanneldaily.com/lack-water-unseen-problem-gaza-conflict/4361/angela-t/

BACK TO TOP

❖ Israel wants Palestine's water and gas

Israel's Prime Minister Benjamin Netanyahu launched his aggression on Gaza using a cover story that lacks evidence and was managed through the media only. Israel didn't reveal a single evidence in the story of "kidnapping" three colonists in an area fully controlled by the Israeli army in the West Bank, except for few seconds of an audio recording that Israel claims an SOS phone call made by one of the kidnapped colonists a few moments after the "kidnaping". In those seconds, we hear a whispering distress and a voice of someone shouting in Hebrew and telling someone to put their heads down. After a horrifying and repressive campaign in the West Bank, Israel announced that it had found the bodies of the three colonists, but did not conduct any autopsy and announce its results to identify the real reasons of their deaths.

No evidence more than a possible manipulated few seconds of an audio recording. Instead, Israel rushed to accuse Hamas of the "kidnapping" and US rushed — as usual — to provide the cover and green light for the aggression when Secretary of State John Kerry stated that "there are indications of Hamas involvement in the kidnapping".

But does the revenge for the three Israelis requires mobilising the elite brigades in the Israeli army and more than 60,000 soldiers?

The goals appears to be greater than revenge, and the failure of the Israeli army in its disgraceful aggression on the 365 square kilometres overpopulated and besieged Gaza Strip, is not an indication of a heroic steadfastness of Gaza's people only, but rather an evidence of an abnormal eagerness to achieve objectives beyond retaliation.

This aggression is the fourth of its kind waged by Israel against the Palestinians since the establishment of Palestinian Authority in 1994. The invasion of the West Bank in 2002, followed by the aggression on Gaza in 2008 and again in 2012 down to the current aggression. When Hamas and Palestinians declare unanimously that one main goal of the current aggression is subverting the reconciliation and solidification of schism among Palestinians, this is the accurate personification of the Israeli strategic goal in preventing any path for the growth of a Palestinian state. The ideal means to achieve this is sustaining of the Palestinian schism and prevent the formation of a unified West Bank and Gaza Strip government. The exaggeration in targeting civilians and committing massacres

is quite intentional in order to enhance the feelings of discontent among the population of Gaza and deepening resentment towards their fellow citizens and the Palestinian government in the West Bank over its inability to help them due to an objective compelling reasons.

Why such a goal is an extremely important for Israel to this extent? It's resources. Water and potential resources in the land and the sea. The importance of this goal can't be underestimated, and more than sufficient to justify a central goal for the Israelis to prevent the emergence of any unified Palestinian government because this government is the legitimate exclusive owner of these resources in the Palestinian territories according to international law. Let us not forget that Israel captured by de facto all water resources in West Bank during its long occupation. This time, the precious target is not water but gas.

The story of Palestinian gas resources started in 1999 when British Gas (BG Group) and its partner, the Athens based Consolidated Contractors International Company (CCC), were granted oil and gas exploration rights in a 25-year agreement signed in November 1999 with the Palestinian National Authority.

Michel Chossudovsky, professor (emeritus) of economics at the University of Ottawa, and other writers explain Israeli efforts to control these gas fields and prevent Palestinian government and Hamas from gaining any income from the fields by all means. (Global Research Centre for Research on Globalisation website,8 January 2009).
Chossudovsky stated that "from a legal standpoint, the gas reserves belong to Palestine" adding that "the death of Yasser Arafat, the election of the Hamas government and the ruin of the Palestinian [National Authority have enabled Israel to establish *de facto* control over Gaza's offshore gas reserves".

The importance of these fields lies in the huge reserves which were estimated by BG up to 1.4 trillion cubic feet, worth up to an estimated $4 billion, while Chossudovsky says that the size of Palestine's gas reserves could be much larger.

The ideal means for Israelis to capture these resources is to push the Palestinians always into the swamp of division and civil war to prevent the formation of a unified Palestinian government by all possible means, on top of that by waging war against them. The importance of such Palestinian government is not political or sentimental but an indispensable necessity because it's the legitimate

and exclusive owner of all natural resources in the Palestinian territorial soil and waters by virtue of international laws. Remembering that the story of the three colonists started in less than two weeks following the reconciliation and the formation of the Palestinian transitional government last June, explains the rush by Israel to wage this aggression

It's an existential struggle, and the seizure of resources, is the central objective which sums the history of Israel itself and the most obvious explanation for the ongoing wars against Palestinians since 1994 to prevent any path for the growth of an independent unified Palestinian state.

But the issue of natural resources, show clearly how the calls for a solution of the Palestinian National Authority that emerges from time to time by critics and disaffected towards Palestinians government are just nihilistic calls and a providence gift to Israel. Such a solution would only leads Palestinians to the loss of all their natural resources after losing their territories because Israel will capture those resources by *de facto* as long as the legitimate owner of these resources recognised by the world, concede his rights voluntarily.

"Israel wants Palestine's water and gas", 27/07/2014, online at: http://gulfnews.com/opinions/columnists/israel-wants-palestine-s-water-and-gas-1.1364615

BACK TO TOP

❖ Oxfam warns food, water running low in Gaza

London - Thousands of Palestinians have fled their homes but have nowhere safe to shelter from Israeli airstrikes, charity Oxfam said on Wednesday, warning supplies of water and food are dangerously low.

Over 120 000 people are displaced but are prevented from escaping violence because borders with Israel and Egypt are shut, Oxfam said.

"The terrible toll on civilians is shocking. Hospitals and water supplies are under massive strain and the needs are increasing by the day. People are fleeing terrified," said Nishant Pandey, Oxfam's head in Occupied Palestinian Territory and Israel.

Normally such crises would cause people to flee the area, but this was impossible as the blockade prevented people escaping the violence, Pandey said.

"Lasting peace and security for both sides means ending the blockade and the collective punishment of people in Gaza."

The charity said water supplies were disrupted to over one million people, raw sewage was at risk of contaminating the water due to the destruction of sanitation plants, and only half of Gaza's sewage plants are working.

Much of the area, a densely populated strip of land along the Mediterranean Sea, has electricity for four hours a day or less, Oxfam said.

The charity said it was trucking water supplies to 19 000 people sheltering in a mosque, a church, schools and Al Shifa hospital, but that airstrikes made it difficult to deliver aid, and that many of its staff had also had to leave their homes.

"Oxfam warns food, water running low in Gaza", 24/07/2014, online at: http://www.news24.com/World/News/Oxfam-warns-food-water-running-low-in-Gaza-20140723

BACK TO TOP

❖ Rula Jebreal: 90% of people in Gaza 'don't have access even to water'

Palestinian journalist Rula Jebreal slammed the U.S. media for "biased" coverage of the Israel-Palestine conflict on July 21's Ronan Farrow Daily. MSNBC had her back the next night on All In With Chris Hayes to talk about the balance between Israeli and Palestinian guests on major American news networks. We checked a claim from that back-and-forth here.

Jebreal also took it upon herself to trumpet the news she says goes unreported in the United States. "Most Americans think, okay, Israelis are minding their own business and Palestine woke up one day in Gaza and said okay, let me fire missiles," Jebreal said. "That's not what's happening."

"They don't know anything about the siege, 1.8 million Palestinians living under siege in extreme poverty, with 90 percent that don't have access even to water."

By all accounts, the situation in Gaza is bad, but we were surprised to hear that so few people have access to water.

Since bombings started

We weren't able to reach Jebreal, but we did get in touch with Juan Cole, a history professor at the University of Michigan who frequently sounds off on Middle Eastern politics and who Jebreal cited during her interview. In a blog post concurring with Jebreal's assessment of the U.S. media, Cole wrote, "Israeli occupation has left 90% of people in Gaza without potable water."

That's already a step removed from Jebreal -- who didn't distinguish between access to water, and access to drinking water. (The difference would be in having running water available for cooking and showering).

Cole pointed us to the United Nations Relief and Works Agency, which pointed us to the UN Office for the Coordination of Humanitarian Affairs' (OCHA) office in Palestine. Since July 7, when Israel began its military actions against Hamas, OCHA has published daily reports about the circumstances in the Gaza Strip.

OCHA's latest report, covering the period from July 21 to July 22, estimates that "1.2 million people have no or very limited access to water or sanitation services due to damage to the electricity system or lack of fuel to run generators" that provide water, sanitation, and hygiene.

According to OCHA, Israel's bombings are causing definite harm to Gaza's water systems. The UN has been unable to reach several municipalities because of the threat of bombings, leaving them unable to repair 15 broken wells and six inoperative sewage pumping stages. The Municipality of Gaza reports that they're pumping less than half the "required" water.

With a population of 1.8 million, that means that roughly 67 percent of people living in the Gaza Strip could be classified as having "no or very limited access to water."

That's less than the 90 percent Jabreal claimed and does not account for people who may have limited access to water.

Water potability

So in the most literal reading, Jabreal is overstating the statistic. But another way to look at Jebreal's claim is the way Cole said it, that 90 percent of people in Gaza lack access to potable water.

That's close to being accurate.

The only natural source of fresh water in Gaza is an aquifer on the southern part of its coast, and according to a 2009 Amnesty International report, 90 to 95 percent of that water isn't safe for drinking because of seawater, sewage, and runoff from agriculture. That statistic has since been corroborated by the UN.

Before the current crisis, roughly 97 percent of households in Gaza had access to water coming from the aquifer, but that the aquifer alone cannot sustain the Gaza Strip. In April 2013, the head of the Palestinian Water Authority estimated that Palestinians purchase 56 million cubic meters of water a year for drinking to make up for what he calls a "severe shortage." And according to the UN, four-fifths of privately sold water isn't sanitary.

What does that all mean? People living in Gaza have access to potable water, but they have to buy it from an outside source. The natural aquifer that people living in Gaza have access to largely is unsafe for drinking.

We should note that this problem began well before Israel began bombing. The UN sent Princeton professor Richard Falk to the Gaza Strip in 2013 to report on humanitarian concerns, and Falk wrote that "the Israeli blockade of Gaza has exacerbated water scarcity." Among other things, Falk said, Israel takes a "disproportionate share of water from the coastal aquifer," the Israeli-Palestine Joint Water Committee disproportionately rejects Palestinian proposals for water wells, and Israeli military operations often destroy existing Palestinian wells.

Our ruling

Jebreal claimed that "90 percent" of people living in Gaza "don't have access even to water," in the course of arguing that a significant part of the Israel-Palestine situation goes unreported in the United States.

Recent estimates suggest that about 67 percent of people living in Gaza currently have little or no access to running water, a figure lower than Jebreal claimed. But what's true is that 90 to 95 percent of the water from Gaza's coastal aquifer (their only natural source of fresh water) isn't suitable for drinking.

Jebreal's claim needs that caveat. As such, we rate her statement Mostly True.

"Rula Jebreal: 90% of people in Gaza 'don't have access even to water"', 22/07/2014, online at: http://www.politifact.com/punditfact/statements/2014/jul/24/rula-jebreal/rula-jebreal-90-people-gaza-dont-have-access-even-/

BACK TO TOP

❖ New water balance calculation for the Dead Sea

Tel Aviv/Halle, Saale. The drinking water resources on the eastern, Jordanian side of the Dead Sea could decline severe as a result of climate change than those on the western, Israeli and Palestinian side. This is the conclusion reached by an international team of researchers that calculated the water flows around the Dead Sea. The natural replenishment rate of groundwater will reduce dramatically in the future if precipitation lowers as predicted, say the scientists, writing in the journal Science of the Total Environment. Even now, the available groundwater resources in the region are not sufficient to meet the growing water requirements of the population and agriculture. If the situation worsens, it could therefore have serious social, economic and ecological consequences for the region.

Important data for water providers

A reliable inventory of existing water resources around the Dead Sea, on the border between Israel, Palestine and Jordan, forms the basis for sustainable water management. The lowest lake on earth is not only one of the biggest tourist attractions in the Middle East; more than four million people rely on the groundwater resources in its catchment basin. For a long time, the complex hydrology of this region presented major unknown factors in the local water balance equation. To some extent it still does. Thanks to improved computer simulations, the researchers were able to work out – on an international scale for the first time – how much water actually infiltrates from rainfall and replenishes the groundwater reservoir: around 281 million cubic metres per year. This means that we now also know what the maximum withdrawal limit should be if this resource is to be managed sustainably.

A complicated puzzle with many pieces

Since the 1960s, the majority of the Dead Sea's tributaries have been dammed to capture the precious water before it disappears into the salt lake. However, this apparent salvaging of water is causing the water level of the Dead Sea to fall by around a metre per year and, with it, the surrounding groundwater levels. Fresh water springs thousands of years old are ebbing away. This much was already known. What was not clear was exactly what impact the retreating water levels have on the quantities of usable groundwater. Over the past five years, the team of researchers from Germany, Israel, Jordan and Palestine working on the SUMAR research project therefore used a combination of

comprehensive on-site measurements, remote sensing and computer modelling systems to be able to provide a fairly complete answer to this question.

Tracing the course of the water

The springs in and around the Dead Sea were identified using infra-red sensors on aircraft and satellites, as well as chemical and isotopic methods. "By analysing rare earth elements in particular we were able to trace the origin of the water and the routes it takes underground," reports Dr Christian Siebert of the Centre for Environmental Research (UFZ). "Not only were we able to locate 37 areas where groundwater flows into the Dead Sea, we now also know the history of each source. This was important for finding out how much fresh water flows into the Dead Sea underground and is therefore no longer available to use as drinking water. The last passage in particular, before the water from the mountains reaches the lake, took us a long time," says the hydrogeologist. "Here, salt water rising from below mixes with the fresh water, and salt minerals are dissolved in it. But, together with colleagues from the Max Planck Institute in Bremen, we also managed to identify the biogeochemical processes that make permanent changes to the groundwater."

Computer models calculate the total water balance

In the end, all the available data were fed into computer models that revealed, more accurately than ever before, the situation in the drainage basin in the immediate vicinity of the Dead Sea – an area measuring roughly 7000 square kilometres. The biggest challenges were the heterogeneous distribution of urban areas and the associated gaps in the data. Whereas the number of measuring stations in and around built-up areas like Jerusalem and Amman is very high, there are broad stretches of land that are very sparsely populated and therefore have only few wells and almost no geological or meteorological data. Yet rain is particularly important in this context. The region is characterised by short, heavy downpours that often fall over a very small area. For this reason, the project team set up its own measurement stations so as to be able to measure the flash floods that result from these downpours. A comprehensive flow-measuring station was also set up on the River Jordan near one of the baptismal sites that attract thousands of Christian pilgrims every year.

Bleak forecasts

Using the models, the scientists were able, for the first time, to make predictions about possible future changes in the groundwater resources that are so vital for this region: the western (Israeli-Palestinian) side of the lake receives almost twice as much rainfall as the eastern (Jordanian) side. As a result, groundwater replenishment rates are currently around 50% higher on the western side. Climate scenarios predict a decrease in annual rainfall of around 20%. However, the water that currently ends up underground and replenishes these important groundwater resources would be halved. The decrease on the western Israeli-Palestinian side is expected to be around 45%, whereas the water available for the Jordanian (eastern) side would fall by nearly 55%. The social and economic situation could therefore worsen, in Jordan in particular.

Recycling as a way out of the water crisis

Saving and reusing water could therefore be a solution, and the UFZ researchers are developing this concept further with colleagues from Israel, Palestine and Jordan. For instance, the SMART project researched ways of stabilising water supply in the Middle East. The UFZ developed new concepts for decentralised wastewater treatment and made a significant contribution to the water master plan of Jordan, one of the world's most arid countries. Great importance was attached to adapting the wastewater treatment concept to local conditions, and to collaborating with local scientists and authorities. A special implementation office was set up in Jordan's Ministry of Water in Amman.

Ongoing research

Since completion of the SUMAR project, the research has been continued by the Helmholtz centres KIT (Karlsruhe), GFZ (Potsdam), UFZ (Halle) and local partners within the DESERVE (DEad SEa Research VEnue) project. The aim of the meteorologists, hydrogeologists, geologists and geophysicists involved in the project is to look at environmental risks, water availability and climate change as a whole, so as to develop solutions for this unique region, not only so that people will be able to continue to visit the biblical sites, but also so that the people of this region can continue to live there. A stable water supply will therefore play an important role in bringing peace to the Middle East. Whether the region will ever build the canal intended to carry water from the Red Sea to the Dead Sea remains to be seen. Scientists like Christian Siebert are critical of the possible consequences of importing water in this way: "For instance, it is unclear whether the much lighter ocean water will mix with the Dead Sea water, which is ten times more saline, and we cannot be sure

what biological and chemical processes will take place." The impacts on the surrounding groundwater are also disputed.

"New water balance calculation for the Dead Sea", 23/07/2014, online at:
http://environmentalresearchweb.org/cws/article/yournews/57970

BACK TO TOP

❖ Israel's secretive water canals to ignite war with Lebanon

As Israel's theft of water from Lebanon's rivers is going on, analysts say water shortages might lead to an all-out war in the Middle East.

Reports say, Israel is stealing water from one of Lebanon's most important rivers - Litani - through building underground channels of water from these rivers, and then leading it to the Hasbani River, which runs through Occupied Palestine and Jordan.

Considering the water shortages in the Middle East, experts say Israel's illegal moves in violating the international rivers laws, and stealing Lebanese and regional waters can cause severe confrontations in the future.

They argue that a brief historical review shows that Israel's initial intention in invading Lebanon has always been to seize its water resources.

Lebanon is entitled under international law to draw some of the waters of the Hasbani River for its own uses.

In the 1950s, the so-called Johnson Plan – an arrangement to share the waters of the Jordan River (including the Hasbani) between Lebanon, Syria, Israel and Jordan – granted the Lebanese an annual allowance of 35 million cubic meters.

From then on, Beirut has been seeking to implement the Litani and Wazzani water projects to irrigate southern villages, a move which irks Israeli officials.

"Israel's secretive water canals to ignite war with Lebanon", 21/07/2014, online at:
http://www.presstv.ir/detail/2014/07/21/372221/israels-water-theft-can-ignite-mideast-war/

BACK TO TOP

❖ Food Insecurity a New Threat for Lebanon's Syrian Refugees

BEIRUT, Jul 22 2014 (IPS) - A declining economy and a severe drought have raised concerns in Lebanon over food security as the country faces one of its worst refugee crises, resulting from the nearby Syria war, and it is these refugees and impoverished Lebanese border populations that are most vulnerable to this new threat.

A severe drought has put the Lebanese agricultural sector at risk. According to the Meteorological Department at Rafik Hariri International Airport, average rainfall in 2014 is estimated at 470 mm, far below annual averages of 824 mm.

The drought has left farmers squabbling over water. "We could not plant this year and our orchards are drying up, we are only getting six hours of water per week," says Georges Karam, the mayor of Zabougha, a town located in the Bekfaya area in Lebanon.

"Any major domestic or regional security or political disruptions which undermine economic growth and job creation could lead to higher poverty levels and associated food insecurity" – Maurice Saade of the World Bank's Middle East and North Africa Department

The drought has resulted in a substantial decline in agricultural production throughout the country. "The most affected products are fruits and vegetables, the prices of which have increased, thus affecting economic access of the poor and vulnerable populations,"says Maurice Saade, Senior Agriculture Economist at the World Bank's Middle East and North Africa Department.

According to the Food and Agricultural Organization (FAO), food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs. Although most households in Lebanon are considered food secure, lower income households are vulnerable to inflationary trends in food items because they tend to spend a larger share of their disposable income on staples, explains Saade.

Lebanon's poverty pockets are generally concentrated in the north (Akkar and Dinnyeh), Northern Bekaa (Baalbek and Hermel) and in the south, as well as the slums located south of Beirut. These areas currently host the largest number areas of refugee population, fleeing the nearby Syria war.

According to Clemens Breisinger, senior research fellow at the International Food Policy Research Institute (IFPRI), Lebanon currently imports about 90 percent of its food needs. "This means meant that the drought's impact should be limited in term of the food available on the market," he says.

However, populations residing in Lebanon's impoverished areas are still at risk, especially those who are not financially supported by relatives (as is the custom in Lebanon) or benefit from state aid or from local charities operating in border areas. Lebanese host populations are most likely the most vulnerable to food insecurity, explains Saade.

According to the UNHCR, there are just over one million Syrian refugees in Lebanon. While the food situation is still manageable thanks to efforts of international donors who maintain food supplies to the population, "these rations are nonetheless always threatened by the lack of donor funding," Saade stresses. In addition, refugee populations are largely dependent on food aid, because they are essentially comprised of women and children, with little or no access to the job market.

Given that Lebanon depends to a large extent on food imports, mostly from international markets, maintaining food security also depends on the ability of lower income groups to preserve their purchasing power as well as the stability of these external markets.

"This means that any major domestic or regional security or political disruptions which undermine economic growth and job creation could lead to higher poverty levels and associated food insecurity," says Saade.

In addition any spikes in international food prices, such as those witnessed in 2008, could lead to widespread hunger among vulnerable populations.

Breisinger believes that despite increased awareness of the international community, the factors leading to a new food crisis are still present.Increased demand for food generally, fuel prices, the drop in food reserves, certain government policies as well as the diversion of grain and oilseed crops for biofuel production are elements that put pressure on the food supply chain and can eventually contribute to hunger in certain vulnerable countries.

To avoid such a risk, some countries have implemented specific measures such as building grain reserves. "I am not sure how Lebanon has reacted so far," says Breisinger. With little government oversight and widespread corruption, Lebanon's vulnerability to food insecurity has been

compounded by unforgiving weather conditions, a refugee crisis and worsening economic conditions which, if left unattended, could spiral out of control.

"Food Insecurity a New Threat for Lebanon's Syrian Refugees", 31/07/2014, online at: http://www.ipsnews.net/2014/07/food-insecurity-a-new-threat-for-lebanons-syrian-refugees/?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=c9874cd2c9-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-c9874cd2c9-250657169

BACK TO TOP

❖ Satellite data measures Nile water for region security

War and other social and economic problems could be prevented in north-eastern Africa now that the total water storage of the Nile Basin can be measured, according to a WA professor. Curtin University Department of Spatial Sciences' Joseph Awange says being able to measure the total water storage of the Nile Basin is significant for the countries that drain water from it because they may be in jeopardy of dishonouring the Nile Waters Agreement.

"If you look at it from water decision issues, the Nile is really a significant water body in the region and Egypt has threatened to go to war several times in case the upper countries overuse the water," Associate Professor Awange says.

"When I say upper countries I mean countries where the Nile begins like Kenya, Uganda, and Ethiopia."

A/Prof Awange says countries draining water from the Nile can now make better informed decisions about how much water to take and what to use it for.

"If war was to erupt in the region, certainly it would be because of the Nile water resources," he says.

A/Prof Awange and other researchers collected satellite data between the years 2002 and 2011. The group used data from the Gravity Recovery And Climate Experiment (GRACE) mission, which detects spatio-temporal variations of the earth's gravity field.

However, use of this satellite data to determine the total water storage (TWS) of the Nile is difficult because stronger signals over the Lake Victoria Basin and the Red Sea obscure those from smaller sub-basins.

To overcome this problem, the study used an advanced mathematical technique called Independent Component Analysis to extract independent TWS patterns in sub-basins from GRACE and the Global Land Data Assimilation System.

A/Prof Awange says it is physically impossible to measure TWS of the entire basin with conventional measurement techniques.

He says the study also has economic implications because many of the fish eaten in Europe—like Nile Perch—come from the Lake Victoria region of the Nile.

He hopes more studies of similar nature will be carried out in the region, allowing for further understanding about the effects of climate change on the Nile Basin.

"The longer period of data we have, the more it will enable us to look at climatological analysis in the region," he says.

A/Prof Awange says an improved version of GRACE will be released in 2017 and will bring more precise data measures.

"Satellite data measures Nile water for region security", 22/07/2014, online at: http://phys.org/news/2014-07-satellite-nile-region.html

BACK TO TOP

❖ Ethiopia Prioritizes Equitability to Nile Water Use – Mwie

Ethiopia is in a better position to sustainably and equitably utilize the Nile with the scientific knowledge provided by the country's scholars, said Ministry of Water, Irrigation and Energy (MWIE).

Minister Alemayehu Tegenu, on a two day symposium concluded Tuesday at Bishoftu, has elucidated the position of Ethiopian government on sustainable and equitable Nile water management with the support of research outputs conducted by Ethiopian scholars.

Various research papers aimed at to further consolidate understanding of the Nile hydrology and geology, soil and water conservation issues have been entertained in the symposium.

Dr Seifu Kebede from the Addis Ababa University said the colossal Ethiopian dam saves water 200 times than the high Aswan Dam, benefiting both the downstream countries of Sudan and Egypt.

Dr Elias Lemi who presented a study on dam safety with regard to integrated geophysics and geodetic approaches articulated the region where the grand dam is being built is proved to be not prone to earthquake.

Currently, placing of Roller Compact Concrete is taking place and one million cubic meters RCC has been placed on the dam marking an important step forward.

The Growth and Transformation Plan of Ethiopia aims to increase the energy sector of the country by over 30% rate each year so as to join middle income nations in 2025.

It is with this intention that the nation is constructing one of the major flagship projects, the Grand Ethiopian Renaissance Hydro Power Dam (GERD) which can generate 6000 Mega Watts.

"Ethiopia Prioritizes Equitability to Nile Water Use – Mwie", 22/07/2014, online at: http://allafrica.com/stories/201407230108.html

BACK TO TOP

❖ China to roll out seven pilot markets for trading water rights

(Reuters) - China has picked seven provinces to host pilotmarkets for trade in water rights, as the government battles a spreading water crisis that threatens to curtail economic growth and hurt food production.

The move is the latest sign that China aims to use market-based mechanisms to handle growing environmental problems. It has already launched seven pilot markets to cut emissions of climate-changing greenhouse gases, and plans to roll out a national scheme later in the decade.

The provinces of Gansu, Guangdong, Henan, Hubei, Inner Mongolia, Jiangxi and Ningxia will draw up rules for their water markets and have them approved by October, the Ministry of Water Resources said on its website.

"We will attempt to make progress in ... policy framework building in the next two to three years, and use the experiences to model a national trading system," the ministry said.

The provincial governments will issue water rights under the scheme, and recipients who use less than they receive can sell the surplus in the market. It remains unclear whether rights will be issued to companies or local governments.

The pilot regions will study how water rights can be distributed and how to register usage rights.

But the legal basis for the scheme could prove controversial, with one expert saying a water trading system could infringe the law.

"China's water is owned by the state, and only the central government can decide how much water is allocated to regions," said Song Guojun, dean of the Environmental Policy and Planning Research Institute at Renmin University in the capital.

"If local authorities trade water it would be a violation of the constitution."

Keeping track of water use rights could also prove tough, another expert said.

"Because water resources are mobile and uncertain, registering water use rights is going to be very difficult," Wang Yahua, a professor at Tsinghua University told local newspaper 21st Century Business Herald.

Water is rapidly emerging as one of the most pressing environmental concerns for China, which is naturally water scarce, and where each citizen's access to freshwater stands at around a fifth that of the United States.

Decades of pollution have left large swathes of rivers, lakes and groundwater too dirty to use.

Food production in some parts of China is threatened by the crisis, which also causes challenges for a manufacturing industry that mostly relies on water-intensive coal-fired power.

The government has launched a $62-billion project to divert some southern rivers to the dry north, and in May the State Council, or cabinet, approved more than 170 schemes to boost supply.

Water-stressed Beijing in April hiked prices for industrial users of water in a bid to stem demand.

In March, the Ministry of Finance said it would launch a national air pollution market to halt China's smog crisis, which prematurely ends half a million lives annually.

"China to roll out seven pilot markets for trading water rights", 24/07/2014, online at: http://www.reuters.com/article/2014/07/24/china-water-environment-idUSL4N0PZ2DJ20140724?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=d45936b661-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-d45936b661-250657169

BACK TO TOP

❖ India bids to reassert influence in Nepal with power pact

(Reuters) - India is set to offer Nepal a landmark pact to help develop its huge hydro-electric power potential as the South Asian giant takes another step to re-assert influence among smaller neighbours where China has been forging closer ties.

Prime Minister Narendra Modi, who went to Bhutan last month on his first overseas trip since coming to power, will soon visit Nepal, which has recently been questioning its position in India's sphere of influence.

Modi's foreign minister, Sushma Swaraj, heads to Kathmandu on Friday to prepare the way for Modi's August visit, the first by an Indian prime minister in 17 years.

The deal to kickstart energy power projects stalled since the Himalayan country drifted into civil war in 1996 will be squarely on the agenda of her talks.

But India's push on energy has ruffled some feathers.

Both Nepal's opposition Maoists, who have long sought to check Indian influence, and members of the ruling Nepali Congress party say the Indians are trying to lock them into an unequal treaty designed to shut out China to the benefit of Indian companies.

"The draft impinges on the sovereign right of Nepal to allow investors other than India in the development of hydropower and renewable energy," said a former Nepali water resources minister, Lakshman Ghimire.

Modi came to power on a promise to make India an economic and military power and his invitation to all South Asian leaders to attend his inauguration was a signal of his regional aims.

While India under its previous government struggled with policy paralysis and a slowingeconomy, China was building ties with its neighbours including Nepal, by helping the army and police and building roads and power projects. In 2012, China's three Gorges International Corp won a contract to build the 750-MW West Seti dam.

While India remains the largest foreign direct investor at $441 million as of July 2014 compared with China's $228 million, the gap is narrowing, according to Nepali figures.

China and India fought a border war in 1962 and border disputes still cloud ties. India and Nepal, on the other hand, have a 64-year-old friendship treaty under which they share an open border and Nepal's citizens are free to work in India.

PROFIT FROM POWER

But over the decades, India has seen its position eroded, partly by resentment in Nepal of perceived meddling in the country's internal affairs.

India says it has become a whipping boy for Nepal's fractious politicians, who have been unable to agree on a constitution since the end of the monarchy in 2008, choking off growth and driving tens of thousands of Nepalis abroad to work.

The energy agreement is aimed at speedy construction of hydro-electric projects, with either 100 percent Indian investment or joint ventures with Indian companies.

Nepal is estimated to have the potential to generate 40,000 MW of power, but it has installed capacity of just 600 MW and suffers blackouts for up to 18 hours a day.

Even tiny Bhutan produces more electricity from rivers cascading down its mountains and is aiming to ramp up capacity to 10,000 MW by 2020 from 1,480 MW, with Indian investment.

"Bhutan is prospering mainly due to the revenue generated from hydropower, while Nepal'seconomy is paralysed because of a lack of power," said an Indian official involved in the negotiations on the power pact.

"Hydro electricity has the potential to transform Nepal, make it one of the richest countries in the region."

The deal outlines cooperation on energy trading and on transmission lines and grid connectivity and in no way curbs Nepal's right to develop its resources, said the official, who declined to be identified.

India also has security concerns, in particular that Islamists could exploit Nepal's instability to use it as a base from which to infiltrate into India. India hopes the talks will bring progress on an extradition treaty to deter anti-India militants from seeking refuge in Nepal.

With the centrist Nepali Congress in charge in Kathmandu after the Maoists, India had a better chance of improving ties, said Alyssa Ayres, a former U.S. State department official and a South Asia expert at the Council on Foreign Relations.

"Given the increasing Chinese footprint in Nepal - as a development partner, foreign investor, military supplier and a power increasingly shaping how Nepal treats Tibetan refugees - India would surely want to shore up its own ties to ensure Indian influence doesn't dissipate," Ayres told Reuters. (Additional reporting by Frank Jack Daniel; Editing by Robert Birsel)

"India bids to reassert influence in Nepal with power pact",24/07/2014, online at:
http://www.reuters.com/article/2014/07/23/india-nepal-idUSL4N0PY1IS20140723?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=d45936b661-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-d45936b661-250657169

BACK TO TOP

❖ Thai Rice Harvest Seen Dropping on Drought, Subsidy Lapse

Rice production in **Thailand** will probably shrink to a five-year low as drought hurts yields and farmers curb planting after the end of a subsidy program, according to the Thai Rice Packers Association.

Output in the largest shipper after India may drop 10 percent to about 34 million metric tons in 2014-2015, said Somkiat Makcayathorn, the group's president. That would be the lowest level since 2009-2010, when the Southeast Asian nation produced 32.4 million tons, according to data from the Office of Agricultural Economics, the Bangkok-based state forecaster.

While a smaller harvest would curb farm incomes, a decline in supply may ease the challenge faced by the country's military junta as it seeks to sell off record stockpiles that built up under the now-defunct subsidy program. Dry weather may also hurt rice output in **India** this season, according to the Rome-based Food & Agriculture Organization, which forecasts the first contraction in global stockpiles in a decade.

"Production has been affected by both drought and the lack of a price subsidy," Somkiat said in a phone interview in Bangkok on July 21. "The prospect of a production decline provides an opportunity for the junta to release stockpiles."

Drought spread across 49 of Thailand's 77 provinces since September, with rainfall in May 31 percent below the 30-year average, according to government data. Yields may decline 20 percent to 50 percent because of below-normal rain and inadequate water supplies, according to a Bloomberg survey of 10 farmers in the biggest growing provinces.

El Nino

An El Nino weather pattern, which can parch South and **Southeast Asia** and hurt farm production, remains likely later this year, **Australia**'s Bureau of Meteorology said July 15, while adding that odds of a strong event are increasingly unlikely.

Thai Prime Minister Yingluck Shinawatra, who was deposed by the junta in May, introduced the subsidy in 2011, spurring record output and reserves and ending the country's 30-year reign as the biggest exporter. The program -- which paid farmers a guaranteed above-market rate for their crop -- lapsed in February and the junta is now checking warehouses nationwide to assess the quantity and quality of the grain reserves.

Thai reserves increased from 5.62 million tons in 2011 to 12.8 million tons last year, as exports fell from 10.6 million tons to 6.72 million tons in the same period, according to the **U.S. Department of Agriculture**. Output may drop to 30.5 million tons in 2015 from 31 million tons, the U.S. agency predicts.

Biggest Shippers

Global ending stockpiles may contract 0.9 percent to 179.7 million tons in 2014-2015 on a milled basis, the **United Nations**' FAO estimated in a **quarterly report** last week. The agency forecast a 1.2 percent drop in Indian supply to 157.5 million tons on a paddy basis.

Should India's crop decline significantly from last year on a poor monsoon, it would play quite favorably for Thailand, according to **Darren Cooper**, senior economist at the London-based International Grains Council. Thailand may reclaim its position of the leading rice exporter, Cooper said.

Between July 3 and July 8, more than 100 teams checked 343 warehouses out of 1,787 in Thailand, junta leader Prayuth Chan-Ocha said on July 18. Irregularities, including rice missing from warehouses and quality deterioration, were found in 65 warehouses, Prayuth said in his weekly televised address.

The price of Thailand's 5 percent **broken white rice**, a regional benchmark, rebounded after the junta suspended sales for the inspections. The grade advanced to a four-month high of $433 a ton today, compared with $384 on May 28, the lowest since at least 2008. The price slumped 23 percent last year.

Extra Purchases

The **Philippines**, the largest importer in Southeast Asia last year, may buy an additional 500,000 tons to help boost local supply, Francis Pangilinan, presidential assistant for **food security**, said in a statement today.

"Thai rice is still competitive at current prices, which could boost exports to 10 million tons, becoming the top exporter," said Somkiat, who's also secretary general of the Thai Rice Exporters Association. "Even without impact from dry weather, we should see a production decline because farmers barely make a profit from planting rice."

"Thai Rice Harvest Seen Dropping on Drought, Subsidy Lapse", 23/07/2014, online at: http://www.bloomberg.com/news/2014-07-22/rice-harvest-in-thailand-seen-dropping-on-drought-subsidy-lapse.html?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=21f2f21d9d-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-21f2f21d9d-250657169

BACK TO TOP

❖ Canada's Record Rains Cut Wheat Acreage to Three-Year Low

For the first time in 47 years of farming, Giles Norek got 10 inches (25 centimeters) of rain within 48 hours on his Saskatchewan crops. Half of his 12,000 wheat acres were flooded by the late-June deluge, and the plants that weren't killed are struggling to survive.

"All in all, it's a pretty big disaster," Norek, 63, said in a July 18 telephone interview from his farm in the rural municipality of Spy Hill. Even as the weather has been drier since, he's not expecting damaged plants to recover. "Some of it isn't going to make it. It isn't going to become a good crop," he said.

Widespread flooding after record rainfall in parts of the Canadian Prairies last month is exacerbating the outlook for smaller wheat seedings, which the government had already forecast would fall 7.4 percent this season. Municipalities in Saskatchewan and Manitoba declared a state of emergency after the June storms. The nation is the world's third-largest exporter, trailing the U.S. and **Australia**.

"In a lot of areas, we're hearing of some major losses," Alyssa Mistelbacher, a market analyst with FarmLink Marketing Solutions in Winnipeg, Manitoba, said in a July 21 telephone interview. "Wheat production will fall, but to what degree, it's hard to tell right now."

Sowings will probably drop to 23.5 million acres, 9.8 percent smaller than a year earlier and the lowest since 2011, according to the average estimate in a Bloomberg News survey of seven analysts. The government **forecast** 24.1 million acres in June, before the worst of the rain.

Canola Acres

As many as 3 million acres in Saskatchewan and 2.5 million acres in Manitoba have been flooded and are unlikely to produce a crop, according to estimates from Saskatchewan's government and Keystone Agricultural Producers. The nation's canola plantings will decline to 19.1 million acres, down 5.8 percent from the government's June forecast, and oat seedings will fall 6 percent, according to the analysts surveyed by Bloomberg.

Statistics Canada is scheduled to **release** its next crop forecast on Aug. 21 in Ottawa.

While warm, dry weather in July has allowed producers to return to the fields in southeastern Saskatchewan, some plants remain underwater. Half of the fall-cereal crops and 57 percent of spring cereals in Saskatchewan are behind their normal stage of development, the government said in a July 17 **report**.

Farmer Losses

Manitoba farmers may lose C$1.1 billion ($1.02 billion) from the recent rain and flooding, according to Keystone Agricultural Producers, a Winnipeg-based farm group. As much as C$500 million of those losses may not be covered by existing insurance programs, Doug Chorney, the president of Keystone, said July 18. Farmers who filed claims for excess moisture in 2011 are now paying higher deductibles for less coverage, and programs currently only cover between 50 percent and 75 percent of losses on seeded and unseeded acres, he said.

The outlook for a second straight bumper global wheat crop may limit price gains for Canadian farmers looking to recoup part of their losses. World **inventories** next year will rise 2.8 percent to the highest since 2012, according to the U.S. Department of Agriculture. Futures tumbled 13 percent this year to $5.2475 a bushel at 11:07 a.m. in **Chicago**.

Walter Finlay is still knee-deep in water three weeks after torrential rains flooded almost a third of his 3,000-acre farm in Manitoba, where he grows wheat and canola. He's unable to spray more than half of his crop for weeds because his equipment keeps getting stuck in thick, wet mud.

To access parts of the farm, "I have to go through water," Finlay, 61, said yesterday in a telephone interview from his farm near Souris, Manitoba. "Some of it is three or four inches. Some if it is two feet." The rains have "stunted" the wheat crops, and "it's still not a healthy green color in lots of cases, because of the excess water," he said.

"Canada's Record Rains Cut Wheat Acreage to Three-Year Low", 23/07/2014, online at: http://www.bloomberg.com/news/2014-07-23/canada-s-record-rains-cut-wheat-acreage-to-three-year-low.html?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=21f2f21d9d-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-21f2f21d9d-250657169

BACK TO TOP

❖ California Water Prices Soar for Farmers as Drought Grows

Farmers in **California**'s Central Valley, the world's most productive agricultural region, are paying as much as 10 times more for water than they did before the state's record drought cut supply.

Costs have soared to $1,100 per acre-foot from about $140 a year ago in the Fresno-based Westlands Water District, which represents 700 farms, said Gayle Holman, a spokeswoman. North of **Sacramento**, the **Western Canal Water District** is selling it for double the usual price: $500 per acre-foot, about 326,000 gallons (1.2 million liters).

"This year the demand was great, the competition was high," said Ted Trimble, general manager of Western Canal, which represents rice farmers. "You have huge demand in the southern end of the state."

The drought gripping the state that supplies half the fruits, vegetables and nuts consumed in the U.S. has led federal and state providers to curtail the water they distribute to California's farmers. That's prompted districts representing growers to buy and sell for escalated prices from other parts of the state as thousands of acres go unplanted.

The drought threatens to boost produce costs that are already elevated following a December frost, according to the U.S. Agriculture Department. The price of fresh fruit is forecast to rise as much as 6 percent this year, the department said last month. Dairy products, of which California is the biggest producer, may rise as much as 4 percent.

Almonds, Avocados

Agriculture consumes about 80 percent of all delivered water in the most-populous U.S. state. California's 80,500 farms and ranches supply everything from milk, beef and flowers to some of the nation's largest fruit and vegetable crops, including almonds, avocados and strawberries.

After three years of record-low rainfall, 82 percent of the state is experiencing extreme drought, according to the U.S. Drought Monitor, a federal website. Governor **Jerry Brown** in January declared a state of emergency and called for a voluntary 20 percent cut in water use.

Farmers and local water officials say the surge in water prices stems from the government decision to limit the water they provide. The U.S. Interior Department's Bureau of Reclamation supplies water to a third of the irrigated farmland in California through a 500-mile network of canals and tunnels. In

February, the agency made its initial allocations, and has since said it would reduce its California water distribution to between zero and 75 percent of contract supply this year.

Federal Water

The rising prices are "a function of supply and demand in a very dry year and the fact that there are a lot of competing uses for water in California," said Mat Maucieri, a spokesman for the Bureau of Reclamation.

Those with senior water rights, many of which date to before 1914, are getting from 50 percent to 75 percent of their water, he said. The rest didn't get any federal water this year because of the severity of the drought, he said.

"We're not delivering nothing," Maucieri said. "For the users who have water rights that are lower in priority, they are in many cases receiving zero because there is not enough water in storage to meet those deliveries for them."

The most severe water shortages are in the San Joaquin Valley, in an area from Bakersfield to Patterson and Chowchilla, said Mike Wade, executive director of the California Farm Water Coalition, a Sacramento-based group representing farmers and most agricultural irrigation districts in California.

"Those are the areas that are hardest hit and that are seeking water transfers to bring water from other parts of the state that have some that they're able to share," Wade said.

'Difficult Decisions'

Prices range from $1,000 to $2,000 per acre-foot, with higher costs in the southern part of the state, he said.

The Westlands district, created in 1952, is among those that didn't get any water from the Bureau of Reclamation this year, Holman said. About 200,000 acres, or a third of the district's 600,000 acres of farmland, were left unplanted, she said.

"The growers are having to make difficult decisions about how much land they can keep productive," Holman said. "Some growers have had to remove older trees that they felt needed to be sacrificed for a water supply in another area of their farming operation."

Daniel Errotabere, 59, a partner at a family-owned farm in Riverdale near Fresno that gets its water from the Westlands district, bought 600 acre-feet of water at rates ranging from $1,000 to $1,800 per acre-foot, about 10 times what he pays normally, he said.

Rice Farmers

"It's unprecedented," said Errotabere. "These are values that farming doesn't support, but I have to protect the trees and my operation."

In the northern Sacramento Valley, 50 rice farmers this year agreed to forfeit part of their crop and sell their water at double the usual price to drought-stricken peers to the south.

For the rice farmers who give up some of their water, "the price comes down to what they would get for their rice, so the profits are about the same," Trimble said.

President **Barack Obama** offered millions of dollars in aid and other help to California farmers during a visit to Fresno in February.

The water shortage most severely affects the fertile Central Valley with $800 million in lost farm revenue, according to a July 15 **report** by the **University of California** at Davis. Direct costs to agriculture total $1.5 billion, in addition to 17,100 seasonal and part-time jobs, according to the report.

The inflated amounts paid for water reflects "the number of people who don't have access to underground water, who've planted very valuable perennial crops," said Richard Howitt, one of the authors of the report.

"California Water Prices Soar for Farmers as Drought Grows", 24/07/2014, online at: http://www.bloomberg.com/news/2014-07-24/california-water-prices-soar-for-farmers-as-drought-grows.html?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=d45936b661-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-d45936b661-250657169

BACK TO TOP