



# ORSAM WATER BULLETIN

Weekly Bulletin by ORSAM Water Research Programme

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**ORSAM WATER BULLETIN**  
*22 August 2017 - 05 September 2017*

**Key water treatment plant reopened in Mosul**

The Government of Iraq and UNDP's Funding Facility for Stabilization (FFS) officially reopened the Al Qasoor Water Treatment Plant at a ceremony yesterday in Mosul.

Al Qasoor is the second largest water treatment plant in eastern Mosul, providing safe drinking water for 35 percent of residents. The plant provides 12,000 cubic metres of fresh water per hour to 24 neighborhoods, reaching 300,000 people.

Most of the plant's pumps, valves, switches and control panels were destroyed as well as its chlorination system and filtration pools. Work began on Al Qasoor in early May, even as the fighting in western Mosul continued. The Ninewah Water Directorate oversaw the US\$ 1.3 million project, which was implemented by Iraqi company Thfaf Al Rafidain employing hundreds of workers from Mosul.

At the ceremony marking the re-opening of the plant, Ninewah Governor Nofal Hammadi said: "We are doing everything we can to help Mosul rebuild. I'm proud of the Iraqi workers who bravely began work even while fighting was ongoing directly across the river. This project is a vital step to improving the well-being of the people of Mosul, and we're grateful for the continuing support from the United Nations."

"The plant has been repaired in record time," said Ms. Lise Grande, UNDP Resident Representative for Iraq. "Now that the fighting has stopped, everything possible needs to be done to stabilize and reconstruct Mosul."

More than 330 projects are already underway in Mosul through UNDP's Funding Facility for Stabilization.

"Ninety-five percent of all stabilization initiatives are contracted through the Iraqi private sector. This lower costs, ensures high levels of local ownership and generates jobs in the areas where they are needed the most. Nearly 10,000 people from Mosul are working on stabilization initiatives," said Ms. Grande. "There's a lot more to do in Mosul, and we will be there to help the Government and people of Iraq."

Mosul was one of the last major holdouts in Iraq of the Islamic State of Iraq and the Levant (ISIL), which took control of the city in mid-2014. The military campaign to liberate the city started in October 2016 and continued for 10 months. Nearly one million civilians were evacuated during one of the largest managed evacuations in modern history.

Mosul was declared fully liberated by the Prime Minister of Iraq in early July. More than 700,000 civilians are still away from their homes, waiting to restart their lives. Through its Funding Facility for Stabilization, UNDP has been implementing projects in Mosul since late 2016.

Established in June 2015, FFS is working in newly liberated areas in Anbar, Salah al-Din, Ninewah, Diyala and Kirkuk Governorates. More than 1,100 projects are completed or being

implemented across 23 locations. Since the start of the crisis, over 2.1 million people have returned to their homes.

22/08/2017 online at: <http://reliefweb.int/report/iraq/key-water-treatment-plant-reopened-mosul>

### **MP: Water Transfer Will Help Remedy Shortages, Drought**

Transferring water from the Sea of Oman, the Persian Gulf and the Caspian Sea through pipelines to dry and water-stressed regions is the most effective strategy for tackling water shortage in Iran, a member of Majlis National Security and Foreign Policy Commission said.

"Sixteen Iranian provinces covering nearly 60% of the population are on the verge of water tension and addressing the ever-growing issue of water shortage should be fundamentally dealt with by the end of the Sixth Five-Year Economic Development Plan (2017-22) before reaching a point of no return," Abolfazl Hassanbeigi was also quoted as saying by Mehr News Agency on Tuesday.

Pointing to the Persian Gulf littoral states' approach to meet their much-needed demand for potable water, Hassanbeigi said, "Close to 9 billion cubic meters of Persian Gulf water are desalinated per year, of which 5 bcm are consumed by Saudi Arabia and the rest used by Kuwait, the UAE, Qatar and Bahrain."

According to the official, these countries satisfy the lion's share of their needs for drinking water from marine resources.

"To meet the demand of the country's population of around 85 million, Iran is in dire need of 50 bcm of desalinated water," he said, adding that the Energy Ministry is required by the Sixth Plan to deal with the exacerbating problem by transferring water from northern and southern marine sources.

The lawmaker also rejected the idea that transferring water from the Caspian Sea to drought-stricken central provinces would harm the environment.

"Piped water transfer projects of significantly larger scales have been carried out in the US and some other countries and the environment has not been harmed because the projects were implemented through careful planning and implementation," he said.

#### Alternative Solutions

Asked about other feasible and sustainable means of meeting the region's water needs, Hassanbeigi said importing water from neighboring states is high on the agenda.

Referring to Tajikistan as a state whose water supplies are 25 times more than its demand, he added that serious negotiations are underway to purchase water from the country.

Water experts, including Mohammad Darvish, the director of Public Participation Office at the Department of Environment, believe that recycling wastewater by treating it to a certain standard helps combat excessive water use.

According to Darvish, with the current methods of irrigation in farmlands, up to 35 bcm of wastewater are produced.

“We are missing a great opportunity by not recycling such huge volumes of water,” he said.

To put things into perspective, Darvish said 35 billion cubic meters of water are five times the country’s annual drinking water demand.

The agriculture sector gobbles up more than 90% of Iran’s scarce water resources, while the average Iranian uses 250 liters of water per day. In metropolises such as Tehran and Isfahan, it can even go up to 350 liters per day—three times the global average.

According to Hassanbeigi, Turkey and Afghanistan's dam construction policies have not only aggravated environmental problems in Iran but also reduced the flow of water to the country.

"Iran is deprived of 500 million cubic meters of water per annum due to its neighbors' aggressive dam construction schemes," he said, adding that the national security commission should play a more active role to settle the strategic issue by appealing to international bodies.

23/08/2017 online at: <https://financialtribune.com/articles/energy/70926/mp-water-transfer-will-help-remedy-shortages-drought>

### **Call for Employing Biotech to Tackle Water Crisis**

Iran’s top environment official warned that the ongoing water crisis, if left unchecked, could pose a grave threat to national security in the coming years, calling for the adoption of biotechnology to improve water conservation and optimize consumption.

“Water [shortage] is on track to becoming the single serious threat to the national security and stability. Biotechnology should be employed to help tackle the water crisis,” Isa Kalantari, the head of the Department of Environment, told a national conference on biotechnology on Thursday.

It is not the first time an official has sounded an alarm about the critical water situation that has emerged as a top public concern at the beginning of President Hassan Rouhani’s first tenure in 2013.

However, Kalantari did not explain how biotech can help overcome the water crisis.

After his reelection in July to serve a second four-year term, Rouhani appointed Kalantari as the head of DOE to tackle environmental crises.

He replaced Massoumeh Ebtekar who was the target of constant criticism, particularly from the government’s conservative opponents, for the perceived failure to tackle some of the toughest environmental challenges, including the water crisis.

Kalantari noted that Iran is among seven countries facing a critical situation for consuming over 40% of renewable water resources.

“The other six countries are using over 60% of their renewable water supplies, while Iran is draining 110% of its resources,” he said.

The DEO chief cautioned that water resources are being extracted much faster than they can be replenished.

“There exist 88 million cubic meters of renewable water in the country, but the volume being consumed stands at 97 million cubic meters,” he said.

Officials say at least 90% of Iran’s natural water resources have already been depleted to meet the domestic needs and relying on natural reserves is no longer viable.

Kalantari said over half of the environmental problems stems from the water crisis.

“Water shortage is the source of 75% of the country’s environmental problems, with the rest attributable to other issues like air pollution and extinction of species,” he said.

Analysts say Iran’s water reserves are adequate to supply the needs of its 80-million-strong population, but poor management and excessive consumption have made things difficult.

Located in one of the world’s most water-stressed regions, Iran’s average precipitation rate has been lower than the global average over the last 10 years.

03/09/2017 online at: <https://financialtribune.com/articles/people-environment/71587/call-for-emplying-biotech-to-tackle-water-crisis>

### **Iran's pistachio plantation declines due to water shortage**

Iran is losing pistachio orchards due to a water crisis and soil salinity, Mohsen Jalalpour, head of Iran Pistachio Association, was quoted as saying Monday.

Every year between 8,000 and 12,000 hectares of Iran's pistachio orchards are lost due to the above-mentioned issues, the Financial Tribune daily quoted Jalalpour as saying.

"Land under pistachio cultivation in Iran currently amounts to close to 350,000 hectares, while during the 2000s the figure stood at more than 400,000 hectares," Jalalpour said.

Kerman Province in southeast Iran is the country's biggest producer of pistachio, a popular snack. The province once accounted for 70 percent of Iran's pistachio production, but it has now declined to only 30 percent due to a severe water crisis.

"Pistachio is currently cultivated in 19 provinces across the country, all of which are more or less dealing with the same problem," Jalalpour said.

The official also noted that about 150,000 tons of pistachio worth 1.5 billion U.S. dollars are estimated to have been exported from Iran during the current Iranian year starting on March 21, registering an 11 percent and 25 percent growth in weight and value respectively compared with past year.

Iran exported some 135,000 tons of the products worth around 1.2 billion U.S. dollars last year.

Iran, the second biggest producer of pistachio after the United States, is the top exporter of the product that supplies more than 50 percent of the world pistachio market.

04/09/2017 online at: [http://news.xinhuanet.com/english/2017-09/04/c\\_136582727.htm](http://news.xinhuanet.com/english/2017-09/04/c_136582727.htm)

### **€406m Foreign Funding for Khuzestan Water Project**

First Vice President Es'haq Jahangiri has given the nod to the use of foreign financing, in view of the government's limited financial resources, to fund two public projects: pumping water to the northern parts of Khuzestan Province and constructing three hospitals, one each in the cities of Tehran, Shiraz and Tabriz.

The decision was made in a Monday meeting of the Economy Council presided by the veep. The ministers of oil, economy, health, industries as well as the governor of the Central Bank of Iran and the chairman of Iran chamber of commerce were also in attendance, Jahangiri's news portal reported.

Khuzestan is among the many regions in Iran that suffers from water shortage.

Jahangiri told the meeting that Khuzestan can use 406 million euros (\$484 million) in foreign funding for the major water supply project in the north of the province.

According to Health Minister Hassan Qazizadeh Hashemi, Iran needs 70,000 hospital beds. Referring to the recent opening of lines of credit by foreign financiers, Jahangiri called on the Iranian private sector to take advantage of this opportunity and carry out their development projects. Notably, Iran signed its biggest credit line deal in recent years with South Korea's Eximbank last month. The deal envisages as much as €3 billion in loans provided by South Korean companies to finance various projects in Iran.

05/09/2017 online at: <https://financialtribune.com/articles/domestic-economy/71817/406m-foreign-funding-for-khuzestan-water-project>

### **Israeli Innovation in Bolstering the Water Supply**

One of the great ironies of life on earth is that, on a planet that is approximately 75 percent covered in water, the demand for safe drinking water is higher than the supply. Fresh water makes up only about 2.5% of the total water supply, and for a continuously growing population, this creates some limits. Fortunately, technological innovations are creating solutions for a world that needs more water, and Israel is leading the way.

#### **Israeli Drip Irrigation**

Israel, as a small, desert nation, may seem an unlikely water leader in the world. But the limits in natural water resources it faces, combined with a national focus on fostering technological innovation, have led to a boom in developments that are helping the world. Israel leads the way in applying drip irrigation solutions to use water efficiently. This technique allows

farmers to use exactly what is needed to help grow crops. And compared to flood irrigation, drip uses between 25 percent and 75 percent less water, maximizing the efficiency of an increasingly scarce resource. Companies like Netafim, the inventor of this technology, continue to find new ways to improve and expand the use of this work; Israeli companies are working with countries as diverse as Kazakhstan and the United States to efficiently irrigate in arid regions around the world.

### Desalination to Increase Usable Supplies

With most of the world's water supply coming from salt water, conservation is not enough; desalination techniques are critical for helping increase the amount of water you can use every day. Here again, Israel's tech-savvy environment has helped turn challenges into opportunities. The world's largest desalination plant belongs to Sorek in Israel, which applies reverse osmosis to create a daily production capacity of 627,000 cubic meters of water. Israel now obtains 55 percent of its domestic water through desalination.

Processes to remove salt and purify the water supply continue to evolve. For example, Israeli inventors have developed a chemical-free desalination process aimed at improving the safety of drinking water over what previous technologies have allowed.

For investors, this creates a market opportunity to help improve the world and generate a fourfold or greater return while doing so. The world will continue to grow in population, and the innovative power of intelligent people working together will continue to yield solutions to better the living conditions we experience. Israel's experience and expertise in water innovation is leading the way.

29/08/2017 online at:

<http://www.mondaq.com/x/624320/Water/Israeli+Innovation+In+Bolstering+The+Water+Supply>

### **Israeli mayors to US: help resolve Gaza electricity, water crisis**

Southern Gaza border mayors have asked the United States to form an international coalition to help resolve Gaza's water and electricity crisis, which has created a major pollution crisis for Israel.

“There should be an international coalition that would help fund electricity for Gaza,” Sha’ar Hanegev Regional Council head Alon Schuster told US special representative for international negotiations Jason Greenblatt on Wednesday while he visited Israel’s Gaza border.

Schuster handed him a letter from the mayor of Sderot and the heads of four regional council bordering Gaza warning that the situation in which untreated sewage flows daily into the Mediterranean sea and down the rivers into Israel, cannot continue.

“There is serious health and environmental consequences that are expected to affect our area and significantly endanger our residents and the residents of the entire region of southern Israel,” the letter stated.

It explained that “an absurd situation” had been created in which Israel was now investing in infrastructure to halt the impact of the untreated sewage, when the situation could more easily be solved by simply funding Gaza’s electricity.

In June, Israel headed a request by the Palestinian Authority to reduce by 40% the amount of electricity it sends Gaza. The PA told Israel it only intends to pay NIS 25 million of its NIS 40m. monthly bill.

The Palestinian Authority took the measure as part of its push to regain control of the Gaza Strip from Hamas which has ruled it for the past decade after ousting Fatah in a bloody coup.

It followed an onerous tax it placed on diesel fuel for the Gaza power plant, which as a result has operated only intermittently since April.

The lack of power has crippled the treatment of sewage in Gaza, such that some 90,000 cu.m. of sewage flow daily into the Mediterranean Sea and other waterways.

“In the absence of treatment within the Strip, the sewage flows into the territory of the State of Israel – the water reservoirs in the area of the Hof Ashkelon Regional Council, the southern shores of Israel, the drainage basins and the rivers of the entire region,” the letter stated.

“We, the heads of the local councils around the Gaza border area, wish to express our firm reservation about the situation we are facing against our will,” the letter stated.

“As a result of this situation, the desalination plant in Ashkelon has been impacted, which is responsible for the supply of one-fifth of the drinking water of the citizens of the State of Israel,” the letter warned.

“This issue could be as serious as the security threats we have faced in the past 15 years. We are on the verge of a health crisis that does not take into account political borders,” the letter warned.

31/08/2017 online at: <http://www.jpost.com/Arab-Israeli-Conflict/Israeli-mayors-to-US-Help-resolve-Gaza-electricity-water-crisis-503840>

### **Israel's water sources at new low**

These last few years of decreased rainfall have led to record lows of water level measurements in August, the Water Authority reported Monday.

One such negative water level was recorded in the Kinneret (Sea of Galilee), with more water currently being pumped and evaporated out of the lake than water flowing into it. The second is a very low level of water flow into the Mountain Aquifer via the Taninim Springs.

Due to the Kinneret's low water levels, more areas from the bottom of the lake are surfacing as small islands.

In the past four years, precipitation amounts have fallen far below the multi-annual average. The Water Authority says that this year appears to be one of the worst and most difficult years for the country's water resources.

The negative peak in the Kinneret indicates that more water is evaporating than entering the lake from the Jordan River and the streams flowing down from the Golan Heights.

The Water Authority noted that each year in August, an average of 20 million cubic meters of water enter the lake, around 30 million evaporate from it and about five million cubic meters of water are pumped out of it by the state. In total, that is an average decrease of 15 cubic meters.

This year, due to a decrease in the amount of water entering the lake, along with an increase in evaporation due to high temperatures, the amount of water in the lake decreased by 26 cubic meters. The previous record for the August water level decrease was 25 cubic meters, registered in 2014. This year, the water level in the Kinneret decreased during the month of August by 27.5 cm.

Although in the center of the country the amounts of rainfall were closer to the average, the situation at the country's north was far below average. Water flowing into the Mountain Aquifer registered at 0.27 cubic meters per second. This is the lowest this water flow was ever measured at.

Water Authority spokesman Uri Shor said the previous record low was measured in December 2002 and stood at 0.29 cubic meters per second.

In the south, the level of the Dead Sea continues to drop at an alarming speed. In August, the sea's level dropped by 13 cm, similar to last year's level, and by the end of September it is expected to fall by 12 cm more.

According to Shor, due to the desalination plants, the dropping water levels at Israel's natural water sources do not affect the availability of drinking water in Israel. However, "in the absence rain and continued decline in the natural water sources, nature, agriculture and the environment around us are seriously hurt."

04/09/2017 online at: <https://www.ynetnews.com/articles/0,7340,L-5012004,00.html>

### **Lebanon's Paradox: Water Ample yet Scarce**

Lebanon's rainfall is of a dynamic nature. Nuancing on the level of rainfall in Lebanon is Dr. Tarek Salhab, head of the Geography Department at the Lebanese University, and head of the

Climate Department at Rafik Hariri International Airport: “The causes of rainfall in Lebanon come from dynamic laws which are affected by the variability of the jet stream [equatorial and polar] system; historically, no year has witnessed the same amount of rainfall as the previous one. It is important to understand the nature of our rainfall when we are relying on it to assess our country’s water status. We have had rainfall as low as 360 mm per year in 1990, and highs of 1,154 mm per year in 2009.” When asked about droughts in Lebanon, Dr. Tarek Salhab explains that “so far, Lebanon hasn’t experienced 5 consecutive years of low rainfall and therefore hasn’t experienced drought in the purest sense of the word.”

Nevertheless, relatively abundant rainfall and the lack of extremely severe scenarios so far should not allow Lebanon to rest on its laurels. According to the World Resources Institute, Lebanon, along with Bahrain, Kuwait, Palestine, Qatar, UAE, Saudi Arabia and Oman, are likely to experience high water stress in 2040. Climate change, random use of water resources, the inadequate water tariff for publically provided water, the surging demand and the high pollution levels are all factors that might very well substantiate this projection.

For instance, Lebanon captures a small fraction of the water it receives. According to the latest figures available from the Energy Ministry, Lebanon benefits from only two dams: the Qaraoun Dam, on the Litani River; and the Chabrouh Dam, capturing water from rain and from the Laban Spring. However, out of a total respective storage capacity of 220 million cubic meters Mm<sup>3</sup> and 8 Mm<sup>3</sup> for the two dams, only 30 Mm<sup>3</sup> are being exploited from the Qaraoun Dam to meet water and irrigation demand, while the remaining levels are used for electricity generation. Moreover, more than 40 percent of Lebanon’s collected water resources are lost due to leakages in the infrastructure.

Lebanon has been suffering from a chronic mismatch between water supply and demand. According to the World Bank, in 2008, continuity of water supply was low and averaged 7.6 hours/day in the summer season and 13 hours per day in the winter season. Therefore, private water trucks roam the country’s streets to fill the shortage. There are no exact figures on the number of private water providers in Lebanon and no control over the quality or source of their water. Some private water trucks charge \$20 per cubic meter which sums up to a higher annual fee than the \$200 fixed fee charged by the government. As is the case for electricity, Lebanese households are compelled to pay double-bills, one for public services that fall short of delivery and one for private services that step in to fill the shortage.

The exploitation of water resources in Lebanon has been hazardous and random. A study led by the UNDP showed that the number of unlicensed private wells in Lebanon was three times higher than those that are licensed. In Lebanon there are 54,246 to 59,124 illegal wells, the equivalent to 5.6 illegal wells per Km<sup>2</sup> as opposed to 1 illegal well per Km<sup>2</sup> in Spain. Lebanon is excessively exploiting its aquifers absent any thought for the consequences. Over-pumping leads to the seeping of salt water into Lebanon’s porous aquifers and increases the risk of droughts.

The presence of Syrian refugees is exacerbating the water sector’s deficiencies. The Lebanese population is growing and Lebanon is host to around 1.5 million Syrian refugees. Back in 2013, the World Bank sought to quantify the impact of the Syrian presence on the Lebanese

water sector, and estimated that the influx of refugees through August 2013 upped water demand by 26.1 million m<sup>3</sup>/year, 7 percent of the pre-crisis water demand. The current figures are surely higher since the number of Syrian refugees in Lebanon has increased since the date of the World Bank study.

Water resources in Lebanon are also suffering from high levels of pollution. A thorough water sector assessment should not rely solely on the level of rainfall or even the level of captured water; the real focus should be on the portion of water that is viable for domestic or agricultural use. According to Ms. Jihan Seoud, Programme manager for the UNDP's Energy & Environment Programme, "water abundance should be measured by the amount of safe water available. In Lebanon, the water is highly polluted and, therefore, in reality a large portion of the water we manage to capture is not viable for various usages such as drinking or irrigation. Therefore, water needs to be treated and that is costly." Lebanon's rivers, springs and groundwater are all victims of the dumping of domestic and industrial waste. Our soil is likely to be further contaminated if the solid waste that is not being properly disposed of infiltrates it.

Climate change in Lebanon is an already palpable phenomenon and poses a threat to Lebanon's water resources. Climatologists have been seeing higher temperatures on their charts for quite some time. For instance, according to Beirut Airport's climatology department, the maximum temperature reached in August 2005 in Beirut was 30.8°C whereas the maximum temperature reached in August 2015 stood at 34.1°C.

The impact of climate change on Lebanon's water resources is far-reaching. According to the Ministry of Energy, if the temperature rises by 1°C, the total volume of water resources in Lebanon will shrink by an estimated 6 to 8 percent, and by 12 percent to 16 percent if the temperature is 2°C warmer. Likewise, a 2°C increase in temperature is projected to decrease the snow cover by 40 percent, a percentage that rises to 70 percent with a 4°C uptick in temperature. Snow-melt will occur earlier, adversely impacting the recharge of springs and groundwater resources. The shortage of supply suffered by crop growers and households alike will therefore be exacerbated and winter floods will rise by 30 percent. The cost of reductions in agricultural, domestic and industrial water supply is estimated at \$21 million in 2020, \$320 million in 2040 and \$1,200 million in 2080.

When asked to pinpoint solutions to Lebanon's water sector, Ms. Jihan Seoud, the UNDP environmental specialist, believes that all solutions revolve around adjusting the water tariff charged by the government and reforming the sector. The tariff which stands at \$200 per year barely allows for Regional Water Establishments to cover their costs. Ms. Seoud goes on to say that even if the tariff is adjusted, Regional Water Establishments and the Ministry of Energy and Water are under-staffed and would need to recruit competently in order to improve collection efficiency and water service delivery. Cost recovery is essential notwithstanding the national budgetary allocations to the water sector. These measures will be surely helped by more conservation and judicious management of water use.

The building of dams for water storage is a disputed solution among water specialists. Opponents to damming claim that dams are dangerous given the seismic activity of Lebanon

and are expensive for a country with limited fiscal space. Meanwhile, advocates of building dams claim that it is a reliable solution if the choice of the dam's location is thoroughly studied and in line with international best practices. In 2024, Lebanon will witness the completion of the Bisri Dam, a \$617 million project led by the World Bank.

It is possible for Lebanon to artificially replenish its groundwater resources. According to the UNDP's "Assessment of Groundwater Resources," "Artificial Groundwater Recharge" is a technique used globally and in the region. It consists of replenishing aquifers with excess or reclaimed water. This technique would be suitable for Lebanon since storage of our groundwater is difficult due to the high speed at which it flows but also since it can mitigate the sea water intrusion brought about by over-pumping.

Nonetheless, no solution can be implemented if Lebanon does not fill the large awareness gap in the water sector. Out of 5,050 springs in Lebanon, only nine are monitored regularly. Consumption levels are always deduced as rough estimates due to the absence of a proper metering system. Lebanon is endowed with qualified engineers and environmentalists that can make the necessary reforms to prevent further damage to the country's water resources, all that remains is to have the political will to furnish action on the ground.

24/08/2017 online at: <http://www.dailystar.com.lb/Business/Local/2017/Aug-24/416957-lebanons-paradox-water-ample-yet-scarce.ashx>

### **Climate change, refugees worsen Jordan's water woes: scientists**

Hot, dry Jordan faces severe water shortages due to climate change and a refugee influx from neighboring Syria, Stanford University scientists said in a study published on Wednesday.

In a scenario where greenhouse gas emissions continue at their current pace, Jordan is expected to experience a one-third drop in annual winter rainfall, alongside a 4.5 degree Celsius rise in average annual temperatures by 2100, said the study.

Droughts will increase in frequency, duration and intensity compared to the three decades before 2010, it added, suggesting that water stress is likely to exacerbate social tensions.

"Jordan is currently one of the most water-poor countries in the world," said Stanford professor Steven Gorelick, one of the study's authors.

"Beyond 2100, in the absence of additional fresh water supplies - a likely scenario is... groundwater is depleted, agriculture depends solely on treated waste water and rapid population growth through future adoption of refugees becomes an enormous challenge," he told the Thomson Reuters Foundation.

More than 330,000 people have been killed in Syria's war, and millions have been displaced since it began in 2011.

The Jordanian government says the country is now home to 1.4 million Syrians, of whom more than 660,000 are registered with the U.N. refugee agency, UNHCR.

Jordan today has an average annual water supply of 150 cubic meters per capita. The United Nations says countries with less than 500 cubic meters per person face “absolute scarcity”.

Along with more thirsty mouths due to the arrival of refugees in Jordan, the conflict in Syria has disrupted water management infrastructure in the Yarmouk-Jordan River system.

Flow in the river is expected to decrease by up to 75 percent by 2050 compared to its historical average, as a result of human and natural influences in Syria, the study said.

The number of droughts in Jordan and their duration are expected to double between 2071 and 2100, causing a “huge problem”, it said.

Jordan’s government is working to crack down on water theft from pipelines, while improving water management infrastructure, Gorelick said.

Amman, the capital, recycles the vast majority of its waste water and uses this treated water for irrigation, he said.

The country is also moving ahead with new pipelines for groundwater and projects to desalinate water from the Red Sea.

Despite these attempts to improve the situation, the “long-term physical constraints on supply are likely to get much worse”, Gorelick warned.

30/08/2017 online at: <https://www.reuters.com/article/us-mideast-jordan-climatechange-water/climate-change-refugees-worsen-jordans-water-woes-scientists-idUSKCN1BA2ER>

### **Climate Change Forecast for Jordan: 30% Less Rain, Triple the Droughts by 2100**

The crisis in Syria, now in its seventh year, has stressed Jordan's resources terribly as civilians fled the country in droves, many seeking shelter in the neighboring country. In a bitter irony, once the war ends and if Syrian agriculture rebounds, Jordan will be even worse off as it struggles to contend with climate change and mounting thirst, says a forecast for the decades to come.

Climate change is already accelerating the desertification of North Africa and the Middle East. While Houston was hit with its third "once in 500 years" flood in three years – this region is experiencing the opposite. Forecasts for northern Israel and for Jordan in the era of global warming include more frequent and longer droughts, and lower river flows.

Deepthi Rajsekhar of the California Department of Water Resources in Sacramento and colleagues reached their conclusions by modeling surface water resources and demand for water for farming through 2100 under the usual spectrum of climate change scenarios, from the “optimistic” scenario to the foreboding “business as usual” scenario, in which the world takes no meaningful policy action and greenhouse gases continue to be emitted and to accrue.

Their bottom line is terrifying: Comparing the baseline period to 2070–2100, the forecast is for the average temperature to increase by 4.5 degrees Celsius.

Average rainfall in Jordan is expected to decrease by a third, and multiple drought-type occurrences are expected to triple in frequency, from about 8 in 30 years to about 25 in 30 years.

Making things worse, Jordan is downstream from Syria on the Yarmouk River, which threatens its water security even more.

At this point the scientists are predicting that Jordan will get 51% to 75% less Yarmouk water compared to the historical flow rate. And that's if Syria remains a wreck. If irrigated farming there recovers to pre-conflict terms, the water flow over the Syria-Jordan border through the Yarmouk would be half that.

After factoring in land and water use in Syria and Jordan itself, anticipated temperature increases and droughts, the scientists' conclusion is that Jordan is likely to face an enormous freshwater problem.

Countries expecting more drought, and that depend on upstream nations for fresh water, will suffer from water insecurity, they conclude.

#### Counting sheep in the Black Desert

The problems Jordan is expected to face are an example of why the scientific community has become increasingly clamorous in urging policymakers to take climate change and global warming seriously, and instate policies to reduce carbon emissions, fast.

Late last year scientists warned that over 80% of all planetary ecological systems have already been impacted by climate change and late last month, they warned that keeping global warming at "just" 1.5 degrees Celsius, which would make life onerous enough, is approaching the impossible.

By the year 2100, the global temperature is 90 percent likely to increase by 2.0 to 4.9 degrees Celsius above pre-industrial levels, and at this point, there is only a 5 percent chance that global temperatures will increase by less than 2 degrees.

Ironically, just this month the world learned that the forbidding Black Desert of Jordan, so named for its basalt sand and reputation, had sustained wild sheep some 14,500 years ago.

The Black Desert had previously been thought to be too inhospitable to sustain anything much beyond gerbils and the odd nomad. (Here is a link to the paper "Expansion of the known distribution of Asiatic mouflon (*Ovis orientalis*) in the Late Pleistocene of the Southern Levant".)

The University of Copenhagen archaeologists who studied the archaeological remains in the Black Desert – of human habitation and bones – conclude that we really don't know about the

ancient distribution of species. They also optimistically conclude that their findings of mouflon sheep and human survival in this marginal environment "illustrate how adaptive humans were nearly 14,500 years ago in a period of climatic change."

But there's climate change and there's climate change and 14,500 years after we discovered that, the Jordanian desert may prove unsurvivably inhospitable after all.

31/08/2017 online at: <http://www.haaretz.com/middle-east-news/1.809973>

### **'The state has lost control of the Jordan Valley'**

Yehuda Reines, a veteran farmer who lives in the northern Jordan Valley town of Mehola, told Arutz Sheva that the residents of the area face a severe water shortage which causes thousands of acres of agriculture to remain completely dry because of the water theft perpetrated by Arabs living in nearby villages.

The water theft is carried out systematically all year round, but in recent days it seems that the theft has reached record levels.

"There is no water in the morning in all the agricultural areas," Reines said. He explained that there is a water drilling site near [the town of] Mehola, which was established in the 1970s, and since then the Arabs have been setting up pirate connections to steal water from the Mekorot [water company] pipes. According to Reines, the thefts had been relatively small-scale and did not concern the residents very much until relatively recently.

The Arabs have reportedly begun to steal vast quantities of water recently. "There is drilling of 1000 cubic meters per hour. 60-70% go to the Arabs, and the rest they steal. Therefore, on a hot day, it is impossible to find water, and it is possible that tomorrow there will be no water in our houses."

"They connect to the main pipe and steal the water. Mekorot told us to 'turn to the Civil Administration.' but the director does nothing and says that Mekorot must handle the theft of the water along with the police.

"This is a country that has lost power. Every word I add is superfluous. Fifty years of settlement? Fifty years of disgrace. This is nothing else like it," he said.

"Uri Ariel is the only one who tries to help. The defense minister is not doing anything. The Ministry of National Infrastructures does not do anything. The Civil Administration is the worst of them all. Each one blames the others, but in the end we don't have water," he lamented.

Reines, who grows spices for a living, said that even after Mekorot came to destroy the pirate connections to its water pipes, "one day later, the Arabs come to reopen them. They laugh at the Israeli government. If I stole water in Tel Aviv I would go to jail, but here anything goes. It is ignored."

"Our seedlings do not understand the sense of humor of the Civil Administration and Mekorot. The Arabs next to us are processing thousands of dunams with stolen water and our seedlings are disappearing," Reines added painfully.

Mekorot responded to Arutz Sheva's request for comment by saying that the water shortage in the last 24 hours was due to a malfunction in the electricity supply. However, Reines believes that this is a minor problem and the main reason for the lack of water is Arab piracy.

The Civil Administration said in response: "The full responsibility for the water lines and enforcement in this area is that of the Water Authority and Mekorot."

"The Civil Administration mobilized heavily and assisted in enforcement, and only in recent months, under the leadership of the Civil Administration, there were two operations to disconnect pirate water connections in Area B in the village of Bardala in the northern Jordan Valley. The Civil Administration will continue to operate in this field."

01/09/2017 online at: <http://www.israelnationalnews.com/News/News.aspx/234896>

### **Blue Nile records highest water level in 100 years: Sudan**

The Ministry of Water Resources, Irrigation and Electricity in Sudan announced that the Blue Nile, the main river of the Nile, recorded the highest level of water in the last 100 years, surpassing the flood in 1946. The levels of the White Nile and Blue Nile was reported at 17.14 meters in Khartoum, a record high due to heavy rain in Ethiopia.

The ministry warned, in a statement on Monday evening, of serious floods over the next two days, flooding large areas of Khartoum and 12 other states in the north and center of the country.

Water level showed an increase above the annual average in the Blue Nile, due to rain and floods during the past few days, Director of the Nile Forecast Center of the Egyptian Ministry of Water Resources and Irrigation, Eman Sayed, confirmed.

The benefit to Sudan from the rainwater is limited, she added, the flat Sudanese terrain prevents water from reaching the riverbed.

The heavy rainfall in Sudan has caused severe flooding in some areas, Sayed said, pointing out that this weather change will increase water in Lake Nasser in Egypt in the coming few days.

According to Sayed, 85 percent of water flowing into the Egyptian Nile comes from the Ethiopian plateau during this season, beginning the first of August and ending in October, .

So far, the flooding is within the average rate, despite heavy clouds above the Ethiopian plateau. The flood will show its semi-final results next month, she explained.

Although the Nile recorded its highest rise at the confluence of the Blue and White rivers in Sudan, the floods will not have an impact on the High Dam in Egypt, sources said.

23/08/2017 online at: <http://www.egyptindependent.com/blue-nile-records-highest-water-level-100-years-sudan/>

### **Sisi looks to Africa to boost Egypt's standing in Nile dam dispute**

With the objective of advancing his country's interests in the African continent, Egyptian President Abdel Fattah al-Sisi paid visits to Tanzania, Rwanda, Chad and Gabon on Aug. 14-17. The agenda included issues related to Egyptian national security, most prominently the Nile water dossier, and the military and technical support in countering terrorism in West Africa.

Sisi's visits carried messages from the Egyptian political administration, most notably among them that Egypt intends to provide Chad and Gabon with immeasurable military and security support, in terms of capacity building and export of military equipment. This is in addition to Egypt's desire to address the water issue indirectly by prompting the upstream countries to resort to other energy sources, such as wind energy and solar energy, instead of the Nile waters to generate electricity. The president also expressed the Egyptian desire that the Nile waters be used without causing harm to Egyptian interests, stressing that in the eyes of Egypt, the Nile water issue is a matter of life or death that requires the dispute to be resolved.

Although legal differences over the Nile water management were not resolved during the Nile Basin Heads of State Summit held June 22 in Uganda, Egypt is carrying on with a policy of rapprochement and creation of mutual interests to bring African countries, especially the Nile basin countries, on its side.

An official at the Egyptian Ministry of Foreign Affairs, who is informed about the African dossier and accompanied Sisi on his African tour, told Al-Monitor, "Our plan centers on intensive political, diplomatic and technical efforts to revitalize strategic focal areas in East and West Africa, without relying on mediators who have strong ties with the continent's countries, such as the Gulf countries."

In regard to the reason why Sisi included Tanzania and Rwanda in his tour, the official, who declined to be named, said, "We are well-aware of how dangerous it is to rely on a single country as mediator in the Nile water issue. Uganda tried to bring views closer between Egypt and the rest of the upstream countries. But nothing has been achieved yet. Based on that, direct bilateral contacts with the Nile Basin countries were necessary — not only to make the Egyptian views clear but also to create direct interests that would reduce tension and fear and highlight Egypt's keenness to achieve development and assist the Nile Basin countries away from any monopoly over the Nile waters."

The official added, "There is reassessment of the Egyptian political, security and strategic perception in dealing with the African region. The years long social and political negligence has severely harmed Egyptian interests."

Prior to Sisi's visit to Chad, the Egyptian Ministry of Defense signed a joint military and security cooperation protocol with Chad on Aug. 2. Also, the Arab Organization for Industrialization expanded the export of military equipment to a number of African countries. This highlights direct cooperation between African countries to promote military capabilities.

The official said, "The rising terrorism expansion in West Africa and deteriorating situation in Libya were behind the shift in the way Egypt deals with African countries at the security level, changing the strategy of distancing itself from areas of conflict and of refraining from taking sides."

Sisi's trip was widely welcomed by a number of observers in Egypt who considered it to be a step toward restoring strong Egyptian-African ties, after they were neglected for years under the rule of former President Hosni Mubarak. This was following the attempted assassination of Mubarak in Addis Ababa, Ethiopia, in June 1995, which resulted in Egypt refraining from taking part in African summits at the presidential level.

Ayman Abdel Wahab, a researcher at the Al-Ahram Center for Political and Strategic Studies, told Al-Monitor, "The extensive effort toward Africa would promote Egypt's position in the political, trade and military balance of power in Africa, and in facing the risks to Egyptian interests in terms of the Nile waters — in light of the upstream countries' aspirations for development and exploitation of the Nile waters."

Abdel Wahab believes that "the political administration's focus on interests in the restoration of ties with the African countries is necessary to overcome the old sensitivities and accusations that Egypt wants to monopolize the Nile waters. Besides, deterrence is no longer fruitful with the political administration in African countries."

He said, "Cairo's focus on promoting ties with Tanzania and Rwanda — following their harsh stances against Egypt during the Nile Basin negotiations — is designed to break the Ethiopian control over the upstream countries' positions regarding Egyptian interests." However, he added, "While it is too early for the balance of interests to be shifted, Cairo does not have enough time to lessen the anticipated harm to its water security, particularly since Ethiopia is nearing the completion of the Renaissance Dam."

In contrast, during Ethiopian Prime Minister Hailemariam Desalegn's visit to Sudan Aug. 17, the bilateral talks focused on the Nile waters and the Renaissance Dam. This Sudanese-Ethiopian rapprochement started to annoy Egypt, particularly since Sudan is backing up the Ethiopian stance after it was once a strategic ally of Egypt in the Nile waters dossier.

Hani Raslan, an expert on African affairs, told Al-Monitor, "Egypt now needs to try to break the Ethiopian alliance with the Southern Nile Basin countries against the majority — in addition to [breaking] the mobilization against Egypt, which was promoted by the Ethiopian claims on Egypt's absolute sovereignty over the Nile waters. The Egyptian quest for a rapprochement does not need to necessarily result in an alliance with the Nile Basin countries. Yet at least to do without enemies."

The Egyptian political administration has no option other than to work in the long run to maintain its direct interests in the region and secure its basic Nile water resources in particular. This dossier is one of utmost complexity, as the upstream countries insist on exploiting the resources, based on the principle of fair and equitable use of the Nile waters.

25/08/2017 online at: <http://www.al-monitor.com/pulse/originals/2017/08/abdel-fattah-al-sisi-african-tour-maintain-security-interest.html>

### **Why the 11 countries that rely on the Nile need to reach a river deal soon**

More than 300 million people rely on the waters of the River Nile. The Nile river basin contains over 10% of Africa's landmass, in 11 countries: Ethiopia, Sudan, South Sudan, Egypt, Rwanda, Tanzania, Uganda, Burundi, the Democratic Republic of Congo, Eritrea and Kenya. Many of these countries rely almost exclusively on the Nile as their source of freshwater.

Water demand throughout the region is expected to soar. This is on the back of rising populations as well as ambitious initiatives, particularly in Egypt and Ethiopia which have plans to develop hydroelectric power.

The need for cooperative sustainable management of the trans-boundary water, and related, resources of the Basin has never been more compelling.

The Nile is one of more than 260 so-called "international drainage basins" throughout the world where water, and related, resources are shared between two or more nation states.

Historically, vying for these scarce resources has been a source of friction as well as a catalyst for peace, as nations are forced to work together. Disparate, but successful, examples of turning adversaries into improbable partners include: the Indus River Treaty between India and Pakistan, which has survived three wars, and the Senegal River Treaty where four countries share joint ownership of water related infrastructure. In these examples, finding a way to equitably and reasonably share international waters has been the key to success.

### **Grey Area**

The UN Watercourses Convention requires every country that shares an international drainage basin to participate in its use, development and protection. But there is a grey area. The convention leaves it up to individual countries to negotiate what they see as equitable and reasonable.

And despite many decades of concerted effort no comprehensive deal between all 11 countries has yet been reached in the case of the Nile River Basin. Meanwhile, tensions have continued to mount including between Egypt and Ethiopia.

Both Egypt and Ethiopia are arguably more heavily dependent on the Nile river basin than any other countries. The Nile is functionally the only real source of water for Egypt. The preponderance of Egypt's fast growing population lives in the Nile Valley and nearly all of

whom are farmers that rely on the water to grow crops. Yet more than 80% of the water reaching Egypt comes from the Blue Nile which originates in Ethiopia.

Ethiopia's population growth rate is equal to or greater than Egypt's, establishing an equally compelling need for water for increased food production.

The urgency of reaching an agreement to reasonably and equitably share benefits on the Nile Basin can't be overstated. Apart from the need to manage a precious resource carefully, the very process of reaching cooperation would create a stabilising and more transparent atmosphere in the countries that depend on the Nile basin. It would widen political participation, build political stability and spread confidence between states. This is important given that the potential for friction will likely continue to increase as the Nile faces new challenges.

### New challenges

Fresh evidence now points to the fact that both the political and ecological situation in the Nile basin is becoming more precarious.

Water quality appears to be worsening, there are growing water quantity issues and agricultural yields appear to be falling. These challenges are exacerbated by the looming completion of various dams on both the Blue Nile and the White Nile. The biggest of these is the Grand Renaissance Dam in Ethiopia.

There are also new, and increasing, concerns over the potential impact of climate change on the Nile river basin. Recent studies point to two contradictory scenarios that would require completely opposite adaptation strategies: one entails floods and increased runoff, the other water scarcity and possible drought.

At least one study suggests that an increase in global temperatures will cause more evaporation, leading to greater water scarcity. Another study suggests increased evaporation in Egypt will result in increased precipitation in the Ethiopian highlands. This could lead to increased runoff downstream, in Egypt, which may cause floods.

These uncertainties are intensified by the fact that most of the nation states sharing the Nile Basin are generally more likely to be increasingly "water scarce" by 2050. This is due to climate change and increased water demand due to population growth.

On top of all these challenges many Nile countries, particularly Egypt and Ethiopia, continue to have ambitious plans to use more water as well as develop hydroelectricity projects along the Nile.

For example Egypt has embarked on the New Valley Project. This is designed to redirect approximately 4.94 billion cubic meters of water to create and maintain an attractive, habitable area in the Western Desert.

These developments underscore the need to successfully design institutions and legal frameworks, using adaptive management, for the shared water resources. Adaptive

management is a process which aims to reducing uncertainty over time via system monitoring.

Moving forward

There is no “one-size-fits-all” approach to these challenges. But what’s clear is that such agreements can protect the environment whilst also stabilizing and enhancing security at the regional level.

Now is the time for all 11 Nile sharing nation states and the international development community to pull together. They must redouble their efforts to successfully establish and maintain a Nile Basin wide cooperative framework agreement and a Nile Basin Commission. This is not a panacea for all that ails the Nile Basin. However, these initiatives would clearly help focus the region on establishing a nascent international river basin organization that could eventually embrace larger water and energy governance solutions.

27/08/2017 online at: <https://theconversation.com/why-the-11-countries-that-rely-on-the-nile-need-to-reach-a-river-deal-soon-75868>

### **Morocco to build a desalination plant in Casablanca-Settat**

Morocco is finalizing a feasibility study and financial and institutional structures for a new seawater desalination plant project, reports L'Economiste.

The plant will be located in Casablanca-Settat region, and will supply Casablanca.

Desalination plant projects are also reportedly in the pipeline for Al Hoceima, Chtouka, El Jadida, Essaouira, Laayoune, Safi, Saidia, and Tiznit-Sidi; as well as Abengoa’s up to 450,000 m<sup>3</sup>/d project in Agadir.

“With increasing demand and insufficient local resources, the only recourse to reduce the deficit in industrial or agriculture drinking water is desalination of seawater,” said secretary of state for water Charafate Afaïal.

Morocco is currently implementing its Water Security Law and contractual framework, the water table contract, which sets out the rights, responsibilities and obligations of water users and other stakeholders. The aim is to avoid overexploitation of water resources.

A recent study showed that Morocco will need to desalinate 425 million m<sup>3</sup> of water by 2030 to ensure supply.

23/08/2017 online at: <https://www.desalination.biz/news/0/Morocco-to-build-a-desalination-plant-in-Casablanca-Settat/8823/>

### **Morocco to Address Water Supply Concerns at World Water Week in Stockholm**

Morocco is taking part in the ongoing World Water Week conference in Stockholm, being held August 28 to September 1.

The event has gathered world leaders, water experts, and development professionals in order to find ways to improve water resource usage and to highlight the importance of drinking water worldwide.

As the pressure of less available drinking water is growing due to population increases, including in Morocco, such initiatives are critical to prevent a depletion of water resources.

In July, Saad Eddine El Othmani, Morocco's Head of Government said that Morocco is suffering from a lack of water supply and a rise of demand.

“Year after year there is a deficit between water demand and supply. Studies have shown that the annual water per capita share drops at an alarming rate,” he explained.

The amount of water available was up to 2,500 cubic meters per capita in 1980, while in 2000 the water share dropped to 1,010 cubic meters. The head of government added that by 2013 the share had dropped drastically to 720 cubic meters per capita.

Approximately 3,000 officials from nearly 130 countries are taking part in the event. Morocco is being represented by a delegation chaired by Charafat Afilal, Secretary of State in charge of water.

The Moroccan delegation will take part in various high-level meetings and conferences to discuss possible measures to help protect water resources across the world.

Charafat is also scheduled to meet with Loïc Fauchon, president of the World Water Council organization (WWC), in order to discuss the King Hassan II Great World Water Prize.

“The prize was established by the kingdom and the World Water Council in order to pay tribute to the memory of late King Hassan II, and to his strategic vision for His country's sustainable integrated water resources management, in addressing the Kingdom's water security,” said WWC.

The award is given every three years during the opening ceremony of the World Water Forum.

The winner receives a trophy and a certificate as well as a check of USD 100,000.

The 8th edition of the World Water Forum will take place in Brazil in March 2018. The 2015 World Water Forum was held in Korea.

The 2017 World Water Week is organized by Stockholm's International Water Institute (SIWI) in cooperation with Organization for Economic Co-operation and Development, the Water Research Commission, the 20130 Water Resources Group, Swedish and German governments.

30/08/2017 online at: <https://www.moroccoworldnews.com/2017/08/227490/morocco-address-water-supply-concerns-world-water-week-stockholm/>

**Arsenic in drinking water threatens up to 60 million in Pakistan**

It has been called the largest mass poisoning in history. After wells were drilled in Bangladesh and the rest of the Indian subcontinent in the 1970s, millions of people have been exposed to arsenic in drinking water. When leached into water from surrounding rocks and soil, the metal can—at high concentrations—cause skin lesions, cancer, cardiovascular diseases, and neurodevelopmental delays. Now, a study suggests Pakistan might be grappling with its own arsenic emergency, with up to 60 million people exposed to contaminated water.

The extent of the problem first became clear in the 1990s, when a series of studies found high arsenic concentrations across the Ganges-Brahmaputra Delta. The World Health Organization (WHO) warned that 35 million to 77 million people in Bangladesh could be at risk of drinking water with unsafe levels of arsenic. And in 2014, WHO estimated that about 200 million people worldwide are exposed to concentrations exceeding the recommended limit of 10 micrograms per liter of water. Most live in Bangladesh, India, Vietnam, and Nepal.

Previous studies had revealed that groundwater in some areas of Pakistan also contained high levels of arsenic. But the extent of those risks was unknown, says Joel Podgorski, an environmental scientist at the Swiss Federal Institute of Aquatic Science and Technology in Dübendorf and lead author of the new study.

Podgorski's team started by measuring arsenic levels in groundwater samples collected from about 1200 wells throughout Pakistan at depths of 3 to 70 meters. Nearly two-thirds exceeded the WHO-recommended threshold, and extremely high concentrations—above 200 micrograms per liter—were found along the Indus River valley. The higher concentrations tended to occur in areas with higher soil pH and near sand and clay younger than 10,000 years. Older sediments have been exposed to so much water over geological time that most of their arsenic has already washed out to sea. Under specific chemical conditions, the arsenic in younger sediments can dissolve in water and contaminate it, Podgorski says.

Next, the team created the region's first risk map for arsenic, which shows the probability of dangerous concentrations in every part of the country. By estimating the number of people relying on groundwater for drinking, the team reports today in *Science Advances* that 50 million to 60 million people might use water that contains more than 50 micrograms per liter of arsenic, five times the WHO guideline.

"It's a reminder that arsenic remains a serious public health threat in drinking water," says Richard Johnston, a public health engineer at WHO in Geneva, Switzerland, who was not involved in the research. He hopes the predictive method can be applied to other areas of the world with similar geologies to Pakistan.

Other experts hope that the study will motivate Pakistani authorities to test wells in high-risk areas and warn communities. "People should be aware that water in their well has high arsenic," says Charles Harvey, a hydrogeologist at the Massachusetts Institute of Technology in Cambridge. If people are aware of the risks, they could use water from deeper aquifers that are in contact with older sediments, or invest in treating groundwater to remove arsenic.

Peter Ravenscroft, a hydrogeologist and independent consultant based in Cambridge, U.K., says this work will help draw the attention of policymakers and aid agencies to the arsenic threat in Pakistan. “Maps like this have a big impact,” he says.

23/08/2017 online at: <http://www.sciencemag.org/news/2017/08/arsenic-drinking-water-threatens-60-million-pakistan>

### **American experts hold workshop to support Pakistan Water Dialogue Project**

Three experts from the United States Department of Agriculture (USDA) are conducting water-resource workshops in Islamabad this week to support the Pakistan Water Dialogue Project. Eighty-five senior officials and technical experts from the federal and provincial ministries, universities, and NGOs are attending the events, which were organized by USDA and the International Centre for Agricultural Research in the Dry Areas (ICARDA).

Speaking at the inauguration ceremony of the first workshop, David Williams, the US Embassy’s Agriculture Counsellor, said the Pakistan Water Dialogue Project helps farmers to more efficiently capture, store, and use water for agriculture.

The USDA experts leading the workshops are Michael Kucera, an agronomist at USDA’s Natural Resource Conservation Service; Jon Fripp, a Stream Mechanics Civil Engineer at USDA’s Construction and Soil Management Center; and Hilary Landfried, a program manager with the US Foreign Agricultural Service's Office of Capacity Building and Development.

For six years now, USDA, with support from the United States Agency for International Development, has worked to improve watershed rehabilitation and irrigation by promoting practices and technologies that assist in water and soil conservation.

USDA’s work began in 2011, in partnership with ICARDA, with a five-year programme to help rural farmers. The project established over 40 demonstration sites, published 150,000 brochures, held 240 farmers’ field days, and reached 14,000 farmers. Due to these efforts, more than 1,500 farmers have already adopted one or more of the promoted technologies. USDA also partnered with the International Water Management Institute from 2013-2015. This programme brought together local officials and USDA technical experts to develop the Pakistan Water Dialogue Consensus Action Plan.

In 2016, USDA and ICARDA began Phase II of the Pakistan Water Dialogue: Diffusion and Adoption through Partnerships and Action of the Best Watershed Rehabilitation and Irrigation Practices. This programme builds upon management practices developed in the earlier Watershed programme.

23/08/2017 online at: <https://www.thenews.com.pk/print/225374-American-experts-hold-workshop-to-support-Pakistan-Water-Dialogue-Project>

### **Kalabagh Dam ‘critical’ in fight against water scarcity: WAPDA chairman**

Water and Power Development Authority (WAPDA) Chairman Muzamil Hussain on Monday briefed a Senate body on the looming water crisis in the country, saying that the construction of the Kalabagh Dam was critical in the face of severe scarcity of water in the country.

He made these observations as he briefed the 'Senate Forum for Policy Research' on the country's water crisis, highlighting the need for the urgent development of water reservoirs. Currently, Pakistan is facing a severe water scarcity and the country's name has appeared at the fourth spot on the list of the world's 15 'most water- scarce nations'.

The chairman said that the Kalabagh Dam will have the capacity to hold 6.1 million acre-feet (maf) of water and generate 3,600 megawatts (MW) of electricity and added that if the construction of Diamer-Bhasha Dam was not started by 2018, the water crisis may worsen.

"Punjab is willing to make necessary sacrifices for the Kalabagh Dam," said Mohammad Anwar Bhinder, a former lawmaker. "To consider the Kalabagh Dam project as 'anti-Pakistan' is incorrect. It will benefit the whole country," he added referring to the long-running political disputes over its construction.

Awami National Party leader Afrasiab Khattak, however, asked that no further discussion should take place on the 'controversial' project as it had been 'rejected' by three provinces. He said that each WAPDA chairman had spoken about the dam, and regretted that such discussions were still taking place.

The forum, agreeing on the necessity to address the looming water crisis, decided to send a list of suggestions regarding the matter to Senate. "For 20 years, various water projects have been under discussion but nothing has been materialized," the forum said.

28/08/2017 online at: <https://www.pakistantoday.com.pk/2017/08/28/kalabagh-dam-critical-in-fight-against-water-scarcity-wapda-chairman/>

### **Dialogue offers only hope for India and Pakistan: Water Laureate**

Stephen McCaffrey is "the single most respected authority on international water law". As Distinguished Professor of Law at the University of the Pacific in Sacramento, California, McCaffrey is intimately aware of the potential for conflict due to water, but he remains eternally optimistic, seeing transboundary water issues as an opportunity for cooperation rather than for conflict.

Last night, McCaffrey was named the 2017 Stockholm Water Prize Laureate for his trailblazing work and his contribution to the field of international water law at a ceremony held alongside World Water Week, organized by the Stockholm International Water Institute (SIWI).

In an exclusive interview with thethirdpole.net the day before the ceremony, McCaffrey spoke about the India and Pakistan transboundary water conflict, and how he sees it as a chance for

the two countries to foster regional cooperation. “Both India and Pakistan have found that cooperation produces more benefits and stability than conflict does,” he said.

It is remarkable, says McCaffrey, that the Indus Waters Treaty (IWT) – signed by India and Pakistan almost 60 years ago – and the permanent commission it set up, has continued to function between periods of conflict. “Since 1960, there have been 12 instances of armed conflict between India and Pakistan, yet members of the commission continue to meet. Why? Because water is vital. It’s the only avenue for the two countries to relate to each other with respect to these shared water resources,” said the academic, who has also worked as legal counsel to governments in transboundary disputes pertaining to the Ganga, Mekong and Nile rivers. McCaffrey is accredited with articulating the human right to water, recognized by the UN General Assembly in 2010.

As one who believes in dialogue as the only way out of conflict, McCaffrey favours commissions such as the one formed under the IWT. “We find that cooperation through these commissions produces more benefits than no cooperation. I am sure India and Pakistan believe the same thing,” he says. “Unfortunately, India and Pakistan are not so close, but if they keep meeting, at least there is some stability in the knowledge that the two countries know where they are with respect to the six streams of water divided between them.”

Though he says he is no political scientist, McCaffrey believes that such commissions help countries to communicate on a constant basis, which he sees as a starting point on the path to mutual cooperation. “There may have been some problems, but the IWT commission is still in force and it is still observed; in case of a problem they follow the procedures in the treaty.”

Recognizing the water rivalry between the two neighbors, McCaffrey refers to his earlier remarks at World Water Week that the root of the word “rival” comes from the Latin words for river and someone who shares a river with someone else. “This rivalry is not unique to India and Pakistan. But India and Pakistan have other issues that exacerbate the issue.”

McCaffrey feels that the water boundaries of the two countries are mapped out in such a way that it leaves the two countries ripe for conflict. “It is not because of the water per se, but because of the underlying relationship between the two countries that has historical explanations,” he says, adding that water relations between countries are largely dependent on their general politics. “If they have good relations, they can work anything out. If they don’t, the tiniest problem becomes huge. With the development of water resources being what it is, things tend to become cast in concrete – literally. You build dams, and it’s not easy to reverse a dam.”

To achieve a mutually-beneficial result, McCaffrey says it will take a lot of goodwill and trust on both sides. “This may be lacking to some extent in the case of India and Pakistan so it may be that the only option is third party dispute resolution, where you have to live with the third party’s decision,” he says. “But the good thing is that third parties do realise the importance of achieving a balanced solution because if you don’t, the likelihood of acceptance is diminished.” Without a balanced solution, McCaffrey continues, “the party that believes they got the better deal will trumpet that, and the other one will be disgruntled”.

As examples, McCaffrey cites the Baglihar and Kishanganga dams – two famous cases of dispute between India and Pakistan that have gone to third parties. The case of the Kishanganga dam has been in the news more recently, as India is constructing two hydropower projects on the Chenab river. Pakistan had objected to the construction of the Ratle and Kishanganga hydropower schemes, saying that they would adversely impact the flow of the Chenab and Neelum rivers. Under the IWT, both countries had begun negotiations with the World Bank continuing to broker the water treaty between them.

While the World Bank paused its latest arbitration on the Kishanganga dam in late 2016, it recently allowed India to build the two dams, albeit with certain restrictions in light of the IWT.

In the cases of the Baglihar and Kishanganga dams, India sought advice from McCaffrey. “I end up advising one country or the other; that’s just how the system works. It’s unfortunate that these dispute resolution procedures are always, in any treaty, set up this way – that there is an adversarial meeting instead of one that takes advantage of knowledge and different techniques of dispute resolution to achieve a mutually beneficial result,” he said.

In an era when the world is faced with the most pressing challenge of climate change, McCaffrey believes that it is time both India and Pakistan show flexibility. “The unpredictability of the water supply is worrisome. The Indus originates in the Himalayas. The glaciers are going to melt which means too much water; you will get rain instead of snow. Does Pakistan have the storage capacity to handle that much water? Do India’s dams built under the IWT have the capacity to release that much water?”

McCaffrey expresses his tenacious hope for a peaceful and pragmatic solution to Pakistan and India’s water disputes. “What I would hope for is coordinated action and planning, so that the development of the water courses produces the most benefits for both – that’s the ideal. I would hope that the leaders of both countries could support this ideal.”

31/08/2017 online at: <https://www.thethirdpole.net/2017/08/31/dialogue-offers-only-hope-for-india-and-pakistan-water-laureate/>

### **World Bank: Tackle Middle East Water Scarcity to Save Money, Boost Stability**

The Middle East and North Africa region loses about \$21 billion each year because of an inadequate supply of water and sanitation, the World Bank said Tuesday, warning that urgent action is needed to prevent ripple effects on stability and growth.

Poor management of water resources and sanitation in the world's most water-scarce region costs about 1 percent of its annual gross domestic product, with conflict-hit states losing as much as 2 to 4 percent each year, the bank said in a report issued at the World Water Week conference in Stockholm, Sweden.

Deaths due to unsafe water and sanitation in some parts of the region, particularly countries affected by conflict, are higher than the global average, it added.

"As the current conflict and migration crisis unfolding in the Middle East and North Africa shows, failure to address water challenges can have severe impacts on people's well-being and political stability," the report said.

### Peril in Yemen

In Yemen, which is reeling from more than two years of conflict, water supply networks serving its largest cities are at risk of collapse due to war-inflicted damage and disrepair, and about 15 million people have been cut off from regular access to water and sanitation, the U.N. children's agency (UNICEF) said in a separate statement Tuesday.

In Syria, where the conflict is well into its seventh year, water has frequently been used as "a weapon of war," with pumps deliberately destroyed and water sources contaminated, and about 15 million people are in need of safe water, including an estimated 6.4 million children, UNICEF said.

Overall, 183 million people lack access to basic drinking water in countries affected by conflict, violence and instability around the world, it added.

### Better management

With the urban population in the Middle East and North Africa expected to double by 2050 to nearly 400 million, a combination of policy, technology and water management tools should be used to improve the water situation, the World Bank report said.

"Water productivity — in other words, how much return you get for every drop of water used — in the Middle East in general is the lowest on average in the world," said Anders Jägerskog, a specialist in water resources management at the World Bank and one of the report's authors.

Middle Eastern and North African countries are using far more water than can be replenished, said the report.

To reverse the trend, technology and innovation are "essential but not enough," Jägerskog told the Thomson Reuters Foundation. Water governance — in particular, water tariffs and subsidies — must also be addressed, he said.

The region has the world's lowest water tariffs and spends the highest proportion of GDP on public water subsidies. Such policies lead to excessive use of already scarce water supplies and are not sustainable, said Jägerskog.

### Untreated wastewater

Another challenge is that more than half of the wastewater collected in the region is fed back into the environment untreated.

"Along with better water management, there is room for increasing the supply through nonconventional methods such as desalination and recycling," Guangzhe Chen, senior director of the World Bank's global water practice, said in a statement.

Improved water management could bring considerable financial returns, the report noted.

Governments could gain \$10 billion annually by improving the storage and delivery of irrigation water to users, while increasing agricultural production by up to 8 percent, the report said.

Egypt, Syria and Iran — which have the largest proportion of irrigated land in the region — are the countries that could benefit most.

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