



# ORSAM WATER BULLETIN

Weekly Bulletin by ORSAM Water Research Programme

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



**ORSAM WATER BULLETIN**  
*21 November 2017 - 27 November 2017*

**Rehabilitation of Darbandikhan Dam needs \$17.5 Million**

A full rehabilitation of Darbandikhan dam will require \$17.5 million USD after a strong 7.3 magnitude earthquake hit parts of the Kurdistan Region, officials said.

Two teams from the Iraqi government and the Kurdistan Regional Government (KRG) as well as a special United Nations Disaster Assessment and Coordination (UNDAC) team are checking the dam eleven days after the earthquake.

The Director of Darbandikhan Dam, Ahmed Khani, told NRT that they are checking the facility to determine needed repairs. They focused on damage to the dam body, the slides on the right and left banks and an assessment of the rock falls with a focus on future protection.

The water level has been lowered by nearly 70 million cubic meters of water to check visually the damage at the crest of the dam. However, certain sections of the dam that are currently under the water level have not yet been checked because of the lack of scuba diving equipment.

They found that the dam's tunnels, reaching to a depth of 150 meters, have been cracked by the earthquake, officials said. There were also small cracks on the right bank, the left bank was affected and there was damage to the crest of the structure.

Investigative teams said they have not noticed any significant changes in water levels and flow after the earthquake, compared to before it.

Even so, "we have to pursue [an investigation] because other earthquakes could happen following the strong one, and some sections which haven't been damaged by the strong quake could become damaged by future quakes," said Bakir Ahmed, head of the dam's safety section.

NRT reporter, Awat Mahmoud, said that the apparent cracks on the dam and in the tunnels of the dam should be repaired soon.

The UNDAC reported the preliminary assessment of the Darbandikhan Dam as saying there is "no imminent threat" of flooding for the population living downstream.

A delegation from the UNDAC met with a high-level government assessment team from the Prime Minister's office, national operation center of Iraq, last week, to discuss a structural assessment of the dam.

A brief report has been provided to humanitarian agencies and the government with recommendations to perform a comprehensive assessment to fully estimate the level of damage and initiate the rehabilitation process. Funding needed for full rehabilitation is \$17,500,000 USD and of the total \$2,500,000 would be used for the urgent rehabilitation and maintenance.

22/11/2017 online at: <http://www.nrttv.com/EN/Details.aspx?Jimare=17607>

## **World Bank and Ministry of Water Resources evaluate Darbandikhan and Dokan Dams following Iraq quake**

A joint team from the World Bank and the Ministry of Water Resources visited Sulaimaniyah Province to assess the impact of the recent earthquake that hit the Iraq-Iran border on the Darbandikhan and Dokan Dams. Both dams are very strategic. They were built in 1961 for flood control, irrigation, drinking water supply and later power generation was added.

Concerns about the safety and management of these two dams were raised after a 7.3 magnitude earthquake struck the Iraq-Iran border on November 12, centered 30 km southwest of Halabjah in Iraqi Kurdistan, around 217 km northeast of Baghdad.

At the request of H.E. Dr. Haider Al-Abadi, Prime Minister of the Republic of Iraq, the World Bank mobilized a technical support mission to carry out a fact-finding assessment of the damage the earthquake has inflicted on the Darbandikhan and Dokan dams.

“We highly value the partnership between the Government of Iraq and the World Bank office in Baghdad and we appreciate the Bank’s prompt response and cooperation in answering the Ministry’s request for assistance in dealing with this emergency,” commented H.E. Hassan Al Janabi, Minister of Water Resources.

The objective of the Bank mission is to support the Ministry of Water Resources in preparing a detailed diagnostic of the damage that has been caused by the recent earthquake, reviewing the emergency preparedness plan, and preparing an action plan for managing the dams.

The mission found that the dam operator and the technical staff of the Ministry of Water Resources are managing the post-earthquake situation in a highly satisfactory manner. The extent of the further technical support needed will be based on the mission’s findings.

“The World Bank is working hand in hand with the Government of Iraq teams at the dam locations in carrying out a deep dive assessment of the damage caused by the earthquake and putting together a rehabilitation plan to address immediate and longer term concerns,” said Yara Salem, World Bank Iraq Country Manager.

27/11/2017 online at: <https://reliefweb.int/report/iraq/world-bank-and-ministry-water-resources-evaluate-darbandikhan-and-dokan-dams-following>

## **Efficient water use priority for Iran**

The agricultural sector in Iran is struggling with a big shortage of fresh water. Salinization of agricultural land also inhibits agricultural development in the country. For Dutch companies with knowledge of efficient agricultural water use, there are certainly opportunities in Iran. That is what agricultural council Hans Smolders said during the International Entrepreneurship Festival on 1 November in Barneveld.

Three-quarters of the acreage of Iran is located in the arid and semi-arid climate zone. The precipitation varies enormously, from 0 to about 2200 mm per year in the mountains. In large parts of Iran, agriculture suffers from a lack of good quality water.

## FAO research water balance

The availability of water for agriculture, industry and human consumption is increasingly being compromised. This is also evident from a recent FAO study on the water balance in the Mena region (Middle East and North Africa). All Mena countries are faced with a water problem due to climate change and extraction, and that certainly also applies to Iran, says council Smolders.

## Five-year plan

He emphasizes that the Iranian government is aware of the water problem. More efficient use of the scarce ground and surface water is high on the agricultural agenda. According to Smolders, this is also evident from the sixth five-year plan of the Iranian government.

One of the goals in this multi-year plan is to expand the acreage of covered cultivation by 50,000 hectares. At the moment, that acreage is about 11,000 hectares. "In plastic greenhouses, huge reductions can be made in water use, while at the same time the production of horticultural crops is increasing substantially. There are opportunities for Dutch companies that are specialized in horticultural technology", says Smolders.

## Precision agriculture

He also sees opportunities in Iran for the introduction of precision agriculture, where growers, by using sensors, satellite data and geo-information, can use water more efficiently. Only 10% of the agricultural acreage uses modern techniques such as drip irrigation. According to the agriculture council, that acreage will increase in the coming years. Dutch companies can respond to this.

## Salt tolerant crops

According to recent studies, a quarter of the Iranian agricultural acreage has been salinated. This has an adverse effect on the yield per hectare. Smolders therefore sees opportunities for the introduction of salt-tolerant varieties, as have been developed by the Zilt Proefbedrijf Texel (Salt Farm Texel).

The storage losses in the food chain are large. The losses in the potato chain are up to 50%. According to Smolders, Iran is looking for companies that specialize in storage facilities, refrigerated transport and processing of agricultural products.

22/11/2017 online at: <https://investinnhn.com/news/2017/11/22/efficient-water-use-priority-for-iran/>

## **Iran proposes inclusion of water-related issues in COP 24**

In its country statement at Bonn Climate Change Conference (COP 23) Iran has proposed the inclusion of the issue of water in the agenda of COP 24.

The statement which was made by Kaveh Madani, deputy head of the Department of Environment on Research and Education and acting head of International Affairs and

Conventions, was delivered in the High-Level Segment of United Nations Climate Change Conference (UNFCCC) on November 16, 2017 in Bonn, Germany.

Water scarcity which has been largely overlooked in the climate change negotiations as well as the Paris agreement is a serious threat to food security with significant socio-economic implications that will be exacerbated by climate change, the statement said.

“This, combined with water and weather-related extreme events such as droughts, floods, hurricanes, and sand and dust storms have put the health of livelihood of a large portion of the world’s population at great risk. Believing in the need for adopting a nexus approach in developing sustainable solutions to climate change, we propose that the issue of water to be included in the agenda of COP 24,” Madani stated in the High-Level Segment of the COP24.

“We are all pleased to see that there is, finally, a global consensus about the need to act strongly to mitigate climate change and to adapt to its impacts,” he said in the statement, adding, “Reaching this consensus was not a trivial task. While we deserve celebrating this success, we should not forget that the next step is even more challenging. We often get too busy negotiating over the targets that we forget that we also need means and realistic pathways to the end goal.”

“The major unresolved issues now are designing effective policies to change the current development model, to share the burden as to who pays for the economic costs of policy change, to balance environmental and development policies, to reflect fairness in obligations and in payments for costs of change, and to provide developing countries with the means of implementation, particularly finance and technology transfer,” the statement continued.

The statement further explained that “We must put more efforts into identifying feasible paths and processes that can help us address climate change in a fair and cooperative manner based on two fundamental principles. First, because of their historical responsibility for global warming, the developed countries must take the lead in mitigation and in providing finance and technology to developing countries without shifting the burden onto these countries. Second, benefiting from the finance and technology provided by the developed counterparts, the developing countries should take responsible climate actions, but not at the expense of their economic and social development.”

Moreover Iran’s Head of delegation stated that “these key principles are in the provisions of the UNFCCC and the Kyoto Protocol and the Islamic Republic of Iran has defended them strongly throughout the negotiations that led to the Paris Agreement. We strongly believe that unless these principles are fully respected, we just add more targets to our already ambitious agendas of sustainable development, eradication of poverty, proliferation of health and education, etc. without developing the mechanisms that enable us to solve our shared problems through fair cooperation.”

“Movement to a low-carbon economy is one of the environmental mandates of our Supreme Leader [Ayatollah Seyyed Ali Khamenei]. In this movement, as an intermediary step, we have already replaced liquid fuels with natural gas and we plan to further increase the share of this

resource as well as nuclear and renewable energies in our energy mix, in line with our economic diversification goals,” the statement read.

“Iran’s energy transition provides a very competitive market for those interested in increasing energy efficiency and renewable energy development. Iran’s INDC is very candid and offers attractive financial incentives for foreign investors to join in partnership.”

Madani further regretted that “four decades of international and extraterritorial sanctions have had a multiplier effect on the adverse impacts of climate change on Iran, resulting in environmental degradation. The imposition of unilateral coercive economic measures contrary to the international law by some developed countries as well as the politicization of GEF [Global Environment Facility] and GCF [Green Climate Fund] decrease the countries’ ability to cope with the adverse impacts of climate change and violate the rights of many people.

“In transforming Iran’s INDC [Intended Nationally Determined Contributions] into her first NDC [Nationally Determined Contributions], particularly building on the nuclear deal (JCPOA) and elevated engagement of European and Asian partners, Iran’s future plan shall stand ambitious in harmony with the global move and heavily rely on the full implementation of the JCPOA and unhindered financial and technological transactions and transfers. The Islamic Republic of Iran honors its commitments and promises that are fair, balanced and constructive, and help us keep the delicate balance of national development and greenhouse gas emissions reduction,” Madani noted.

“Progress in COP negotiations gives us hope. But we all need to work together to preserve our shared planet. Indeed, we have an obligation to contribute our fair share to this moral imperative,” the statement concluded.

22/11/2017 online at: <http://www.tehrantimes.com/news/418658/Iran-proposes-inclusion-of-water-related-issues-in-COP-24>

### **Iran, Algeria to enhance cooperation on water resources**

Iranian envoy to Algeria Reza Ameri in a meeting with Algerian Minister of Water Resources Hussein Naseeb discussed ways to develop cooperation in the field of water resources.

During the meeting held on Wednesday, Ameri presented a report on the latest conditions as regard Iran-Algeria cooperation in water field.

He also expressed Iranian firms' readiness in implementing technical projects in Algeria such as water purification, desalination system, building dam, etc.

“Iran is ready to hold joint committee meeting on water resources between two countries,” Ameri added.

Meanwhile, Naseen expressed readiness to promote economic ties with Iran.

He invited the Iranian companies to attend tenders held in Algeria.

Algerian Minister called for dam dredging, and expressed the hope for upcoming joint committee to create momentum in water relations.

22/11/2017 online at: <http://www.irna.ir/en/News/82739735>

### **'Major deterioration' in quality in lower part of Jordan River — report**

A new report testing and analysing the quality of Jordan's main surface water resources detected major deterioration in the quality of the lower part of the Jordan River, urging immediate rehabilitation actions for its basin.

Salinity levels in the lower part of the river are high, which indicates that the ecosystem of the Jordan River Basin is threatened and needs rehabilitation actions, according to the report published on Wednesday.

The report is the first publication of the National Telemetry Water Monitoring Project, which is being implemented by the Higher Council for Science and Technology and the Ministry of Environment.

Under the project, funded by JICA, 13 fully automated monitoring stations were dispersed along the Jordan River, Yarmouk River, Zarqa River, King Abdullah Canal and King Talal Dam's inlet and outlet.

The stations tested the water for pollution and abnormalities by analysing the water temperature, potential of hydrogen (pH), turbidity, dissolved oxygen and chemical oxygen demand (COD), among other parameters.

The project's first report indicated that concentrations of phosphorus, nitrogen and COD in the 110-kilometre King Abdullah Canal increased at the canal's meeting point with the Zarqa River, due to the nature of the river's water, which is mostly treated wastewater discharged from Khirbet Al Samra Wastewater Treatment Plant.

However, the increase in the concentrations of phosphorus, nitrogen and COD does not impose any restrictions on the use of the water for irrigation purposes, according to the report, which noted that the water of the canal matches the Jordanian specifications on the quality of irrigation water.

The report also showed that water in the upper and central parts of the canal was of better quality compared to its southern part, where it meets with the Zarqa River.

The King Abdullah Canal, which is supplied by the Yarmouk River, irrigates 40 per cent of the crops in the Jordan Valley, and some 40 per cent of the capital's water, after being treated at the Zai Water Treatment Plant.

Regarding the quality of water at the Yarmouk River, the report indicated that the pH was within the normal average, salinity levels were low and there were no traces of nitrogen and phosphorus, which indicates that the river water is free of biological pollutants.

Meanwhile, the report indicated that the pH in the water of the Zarqa River and King Talal Dam, which is mostly treated wastewater from Al Samra Wastewater Treatment Plant, was within the normal rates.

However, because the water in both places contain nitrogen and phosphorus, a study on how much do crops irrigated by the water of both resources benefit from the two chemicals' concentrations is required, according to the report.

It also recommended that a comprehensive environmental study be carried out for the Zarqa, Jordan and Yarmouk rivers on the water flow of the sources of the rivers, pollutions sources, impacts and quantities, as well as the impact of the Zarqa River on underground water and measures to protect transboundadry water resources from possible contamination.

At a ceremony announcing the launch of the report, Minister of Environment Yaseen Khayyat indicated that the data and results of the project serve as a vital tool for decision makers when drafting policies.

Khayyat highlighted that the data of the project also serve in preserving the quality of water in Jordan, which suffers from water shortage and increasing demand for the precious resource.

22/11/2017 online at: <http://jordantimes.com/news/local/major-deterioration%E2%80%99-quality-lower-part-jordan-river-%E2%80%94-report>

### **Jordan said to demand answers from Israel as Red Sea-Dead Sea project stalls**

Jordanian Water and Irrigation Minister Hazem al-Naser has reportedly sent a letter to Israel asking for an official answer as to whether the Jewish state is still committed to a joint agreement for the construction of a pipeline transferring water from the Red Sea to the Dead Sea.

Earlier in November, Israel notified Jordan that the water project would not move forward until Ambassador Einat Schlein and her staff were permitted to return to their posts in Amman.

Two weeks ago Jordan said it would not allow the embassy to reopen until an embassy guard who shot dead two Jordanian nationals in July was brought to trial. In the wake of that incident, the embassy's staff returned to Israel.

According to a report Monday in the leading Jordanian daily al-Ghad based on anonymous government sources, Israel will have to answer whether it remains committed to the project by the end of the December.

A spokesperson for Regional Cooperation Minister Tzachi Hanegbi would not comment on the report.

The report said there are currently secret talks underway between Israel and Jordanian about implementing the first phase of the plan.



Jordan refused to allow Schlein to return as Jerusalem's envoy after she was photographed along with the embassy guard, named as Ziv Moyal, during a meeting with Prime Minister Benjamin Netanyahu two days after the deadly July 23 shootings.

The incident has put a damper on the so-called Red-Dead project. Several weeks ago Israel and Jordan were to have finalized the details before calling for tenders from international companies to do the work.

Without an Israeli embassy, the Jordanians reportedly wanted to continue the discussions by phone but Israel has insisted on face-to-face meetings, which won't happen until the embassy is reopened, Israel's Channel 10 reported earlier in November.

"The position of the Foreign Ministry and the Prime Minister's Office is that we cannot have a situation where on the one hand the Jordanians do not allow us to reopen the embassy and on the other hand we continue to advance projects that are important to them as if nothing had happened," an anonymous Israeli official told Channel 10.

Jordan has reportedly threatened to continue with the project on its own. Several articles in Jordanian media have cited officials saying that they do not need Israel for the pipeline, and even raising the possibility of bringing in Saudi Arabia as a partner instead.

The \$10 billion project, which some see as an early stage in a regional peace deal, would see the construction of a 220-kilometer (137-mile) pipeline transferring water from the Red Sea to the Dead Sea — the lowest body of water on earth — to benefit Israelis, Jordanians and Palestinians, and replenish the dwindling Dead Sea.

According to the plan, a water desalination plant in the Jordanian city of Aqaba, next to Eilat, will pump its brine (very salty water left over from the desalination process) north to the Dead Sea. This will solve another problem: As desalination provides much-needed water to both southern Israel and Jordan for agriculture and consumption, the brine needs to go somewhere other than the Red Sea, which is home to sensitive corals.

Besides providing a yearly total of 100 million cubic meters of drinking water to Palestinians, Jordanians and Israelis, the Red-Dead project will produce "green energy" and replenish the Dead Sea, which is currently shrinking at a drastic pace.

Hadashot news (formerly Channel 2) reported earlier this month that the Shin Bet had completed its investigation into the embassy incident and concluded that the security guard was justified in shooting Mohammed Jawawdeh, who stabbed him with a screwdriver after learning that he was Israeli. Moyal's landlord was also shot and killed by Moyal by accident during the incident. According to the report, there was no doubt Moyal acted in self-defense and there were no grounds for prosecuting him.

27/11/2017 online at: <https://www.timesofisrael.com/jordan-said-to-demand-answers-from-israel-as-red-sea-dead-sea-project-stalls/>

**Sindh governor downplays Pakistan's water woes at international conference**

At the 3rd International Water Conference held in Karachi, on Tuesday, Sindh Governor Muhammad Zubair turned heads as he failed to acknowledge the water crisis prevalent in Pakistan, especially in Sindh, as one of the most crucial issues faced by the country today.

The third edition of the two-day conference is focused on the 'Future of Water', aiming to mainstream many cross-cutting themes with special focus on youth, the inclusion of women, marginalised groups and poor communities.

The plenary session comprised of Zohair Ashir (CEO of Hisaar Foundation), Simi Kamal (Chairperson of Hisaar Foundation), Rudolph Cleveringa (Global World Programme), Istvan Szabo (Ambassador of Hungary), Ghias Khan (Engro Corporation) and Dr David Grey (Oxford University) and Muhammad Zubair as the Chief Guest.

All speakers highlighted the crisis Pakistan is currently facing with regards to water instability.

Addressing the audience as the last speaker of the plenary session, Zubair kicked off his speech by disagreeing with previous speaker Cleveringa who quoted a United Nations (UN) report stating Pakistan's water crisis is a bigger threat for the country than terrorism.

"Terrorism is a way bigger issue than the water crisis – if someone suggested otherwise, they would be thrown out of the assembly [parliament]," Zubair claimed shrugging.

Putting a curtain on the issue at hand, Zubair instead chose to shed light on Pakistan Muslim League-Nawaz's (PML-N) contribution to solving the gas crisis that Pakistan was facing a few years ago. He stated that Prime Minister Shahid Khaqan Abbasi would be inaugurating yet another Liquefied Natural Gas (LNG) terminal after his return from the Saudi Arabia trip.

Classifying the threats Pakistan is facing, Zubair stated terrorism is at the top of the list followed by trade and energy. "Water is a very low priority." However, he said the federal ministry, just to pressurise and recognise the seriousness of the water issue, has now made a separate water ministry which was previously clubbed with the Ministry of Energy.

A lack of representation from the Ministry of Water Resources was lamented by CEO of Hisaar Foundation, Zohair Ashir, in his speech. Ashir stated that despite invitations to the 3rd International Water Conference, no ministry officials attended.

This was later corroborated by Zubair in his speech who stated that he personally reached out to the Ministry of Water Resources to attend a conference of such importance but "received excuses" instead.

At the water conference, however, Zubair touched on all important issues facing the country but the issue at hand. He undermined the threat of water security Pakistan is facing, raising eyebrows.

He spoke about the importance of Pakistan's bilateral trade with India, highlighted the need for power and energy production to be increased and the federal government's input for projects in Sindh.

When asked about the governor's remarks, CEO Hisaar Foundation said, the "governor didn't disagree that water isn't an issue, he merely meant that given the ground realities, other issues tend to take precedence over it."

The other speakers of the plenary session focused on the urgent need for a robust federal water policy for the country. Moreover, regulating the risks faced by the shortage of water was highlighted.

"Not only citizens, but industries are facing regulatory, physical and reputational risks due to lack of a conservation policy and water regulatory framework," stated CEO Engro Corporation Ghias Khan.

Questions were also raised by speakers to understand the role the private sector can play alongside the government in creating a policy that would allow regulation to lessen the risks.

21/11/2017 online at: <https://tribune.com.pk/story/1564404/1-sindh-governor-downplays-pakistans-water-woes-international-conference/>

### **Ethiopia denies receiving funding from Qatar to build Renaissance Dam**

On Thursday, Ethiopian Foreign Ministry spokesman Meles Alem defended the Grand Ethiopian Renaissance Dam project, she said that Addis Ababa does not need anyone's permission to benefit from its natural resources and denied claims that his country is receiving funding from Qatar to build the Dam.

In a press conference with local media in the Ethiopian capital Addis Ababa, Meles stressed that the reports published by some Egyptian newspapers do not affect the construction work in the dam, pointing out that the percentage of these works' implementation exceeded 60 per cent.

He added that what was published by some Egyptian media that Ethiopia is getting funding from Qatar for the construction of the Renaissance Dam is unfounded and he considered it "unacceptable," stressing that the dam is built using the Ethiopian people's funds.

He also pointed out that along with the construction works in the Renaissance Dam project, Ethiopia will continue to cooperate with Sudan and Egypt in the upcoming stages.

The spokesman added: "The 17th meeting on the Renaissance Dam ended in Cairo few days ago without consensus because of Egypt's intention to include the colonial era agreements of 1929 – 1959 as part of the negotiations."

Last week, Egypt announced that it has frozen technical negotiations with Sudan and Ethiopia following a tripartite meeting in Cairo, after Egyptian officials rejected the two countries' amendments to the studies of the French Advisory Bureau on the Dam and its filling as well as operation.

Over the past few days, the Renaissance Dam matter drew the attention of all Egyptian newspapers and TV programs, both governmental and private.

Last Saturday, Egyptian President Abdel Fattah el-Sisi said that no one could touch Egypt's water share, stressing that it is a matter of "life or death," in his first comment after his country announced the suspension of negotiations.

Egypt fears possible negative impacts of the Grand Ethiopian Renaissance Dam on its 55.5 billion cubic meters share of water, while Addis Ababa says the dam is not aimed at harming Egypt. The electricity which would be generated by the dam will help eradicate poverty and boost Ethiopia's developmental Renaissance.

Ethiopia has been criticizing old conventions that it said took place during colonial times, including the 1929 Convention, the 1953 Convention and the 1959 Convention.

The Convention of 1929 was signed by Egypt with the UK on behalf of "Sudan, Uganda and Tanzania," as the three countries were under British occupation back then. It granted Cairo veto power over any project on the Nile in the upstream countries and Egypt's natural and historical right in the Nile waters.

Egypt signed the 1953 Convention with the UK on behalf of Uganda regarding the construction of Owen Reservoir at the exit of Lake Victoria. The convention ensured that the construction and operation of the dam would not reduce the amount of water which reaches Egypt, modify its arrival date to Egypt or reduce its level in a way that might cause damage to Egypt's interest.

As for the 1959 Convention, which Cairo signed with Khartoum, it includes full control of the Nile waters which reach the two countries. It also includes the approval of Egypt's establishment of the Aswan High Dam, south of the country, and Sudan's establishment of Roseires Dam on the Blue Nile.

It also concerns Egypt's possession of its acquired right of 48 billion cubic meters of the Nile waters per year, as well as Sudan's right of 4 billion cubic meters of the Nile waters per year and the distribution of the water benefit from the 22 billion cubic meters of the High Dam water per year to the two countries, so that Sudan gets 14.5 billion cubic meters and Egypt gets 7.5 billion cubic meters, bringing the annual total share of each country to 55.5 billion cubic meters to Egypt and 18.5 billion cubic meters to Sudan.

24/11/2017 online at: <https://www.middleeastmonitor.com/20171124-ethiopia-denies-receiving-funding-from-qatar-to-build-renaissance-dam/>

## **2.5 Million Yemenis lack access to clean water**

The capital Sanaa and al-Bayda have joined the list of Yemen cities without clean water due to the blockade by a Saudi-led coalition which has cut off supplies of fuel for pumping, the International Committee of the Red Cross (ICRC) said on Monday.

Some 2.5 million Yemenis now lack access to clean water in crowded cities, "putting them at risk of another major outbreak of water-borne disease," and other cities are running out of fuel, ICRC spokeswoman Iolanda Jaquemet said.

Since April, some 940,768 people in Yemen have been infected with cholera, a water-borne disease, in the world's worst epidemic in a single year that has killed at least 2,200, and cases of dysentery are being reported, she said.

"The water and sewage systems in Dhamar and Amaran are now providing only half the normal coverage," Jaquemet added.

The Saudi-led coalition closed all air, land and sea access to Yemen on Nov. 6 following the interception of a missile fired towards the Saudi capital, saying it had to stem the flow of arms from Iran to its Houthi opponents in the war in Yemen.

On Friday, the ICRC said three cities - Saada, Taiz and Hodeidah - had run out of clean water because the blockade had cut imports of fuel needed for pumping and sanitation, depriving close to 1 million people of clean water.

"Today, Sanaa and al-Bayda joined the list," Jaquemet said.

The United Nations has appealed for the blockade to be lifted, saying it could spark the largest famine the world has seen in decades. Some seven million people are already on the brink of famine.

"The situation for dialysis patients, already urgent, is now critical," Jaquemet said.

The ICRC had reports of some 20 kidney patients requiring dialysis having died over the last weeks "due to the non-availability of treatment," she said.

Dialysis centers in the Houthi-held port city of Hodeidah are particularly hard-hit, working at only 30 percent of their capacity, she said. Other centers in Yemen have been forced to close, sending more patients to three ICRC-supported facilities.

"Given the current state of supplies, it is expected that dialysis centers in Ibb, Taiz and al-Bayda will soon be forced to close, leaving close to 1,000 patients without the sort of treatment on which their lives depend," Jaquemet said.

21/11/2017 online at: <http://www.jpost.com/Middle-East/25-million-Yemenis-lack-access-to-clean-water-514790>

### **No one can touch Egypt's share of water: Al Sisi**

Egyptian President Abdel Fattah al-Sisi has warned Ethiopia over a mega hydroelectric dam it is building, which Egypt fears cut into the amount of water it is getting from the Nile.

The Abay, as it is called in Ethiopia, or the Blue Nile, once it left the country's boundary, has long become a river that neighboring countries contest for their share of water.

Now that Ethiopia is building a mega hydroelectric dam, the river has become a bone of contention among riparian countries.

“We view positively the developmental needs of our friends and brothers in Ethiopia,” Al Sisi said speaking at the inauguration of a fish farm in the Nile Delta province of Kafr el-Sheikh. But he also said “We are capable of protecting our national security. Water to us is a question of national security. Full stop,” according to a report by The New Arab.

Egypt, Ethiopia and Sudan have failed to approve an independent study on the potential effects of the Grand Ethiopian Renaissance Dam.

Ethiopia is set to fill the dam’s reservoir while Egypt continues to air its concern that its lion’s share of water will be seriously affected and destroys the livelihood of farmers who depend on the river; while some of its officials have heightened their war rhetoric.

22/11/2017 online at: <https://ethsat.com/2017/11/no-one-can-touch-egypts-share-water-al-sisi/>

### **Egypt unable to find agreement in Renaissance Dam talks**

Egypt has officially announced that the technical negotiations with Ethiopia and Sudan over the Renaissance Dam have failed. The announcement came following a round of tripartite deliberations between all the countries' ministers of water in Cairo on Nov. 11 and 12 regarding the completion of the impact assessment of the Grand Ethiopian Renaissance Dam.

Egyptian Minister of Water and Irrigation Mohamed Abdel Aty said in a Nov. 12 statement, “Egypt is worried about the failure of the technical negotiations because it jeopardizes the future of cooperation between Sudan and Ethiopia and their ability to agree on the Renaissance Dam and to avoid its potential risks while preserving Egypt’s water security.”

The statement of the Egyptian Ministry of Water and Irrigation was a bold revelation of the reality of the negotiations behind closed doors. The negotiations began when Egyptian President Abdel Fattah al-Sisi and his Ethiopian and Sudanese counterparts signed the Declaration of Principles in March 2015 as a cooperation framework on the Renaissance Dam issue.

Ever since, Egypt has taken part in a series of deliberations involving experts and state officials. However, despite the deliberations, the two most contentious points concerning the filling and operation of the dam remain unresolved.

Egypt, Sudan and Ethiopia had formed a tripartite national committee that chose two French consultancy firms to conduct a technical study on the hydraulic, environmental, economic and social impact of the Renaissance Dam on Egypt and Sudan. After agreeing on the terms and the implementation method of the studies, contracts were signed in September 2016 to conduct the studies over a period of 11 months.

But the disputes began surfacing when the consultancy firms started their work.

In the statement issued by the Egyptian Ministry of Water and Irrigation, Egypt accused Sudan and Ethiopia of trying to introduce amendments to the Declaration of Principles "in their interest, knowing that such amendments would undermine the results of the studies and render them useless."

An official in the Egyptian negotiation delegation revealed to Al-Monitor on condition of anonymity the real reasons behind the dispute, saying, "Egypt wants the technical studies to produce clear results about the negative effects of the Renaissance Dam on its water security, in particular the impact on water flow rates to the High Dam lake, the impact on the salinity in Egyptian agricultural lands in the Delta and the drop in electricity generation in the High Dam. But Ethiopia and Sudan are trying to direct the studies in a way that portrays the Renaissance Dam as having positive impacts and plays up shared interests."

The official added, "The most contentious issue is the impact of the Renaissance Dam on Egypt's current utilization of [its historical share of] the Nile Water guaranteed under the 1959 agreement, which Ethiopia refuses to acknowledge. The dispute is pivotal, and the Egyptian delegation cannot let it go because it is a pillar to ensuring Egypt's water interests."

The official noted, "Sudan raised another issue of dispute related to the suitability of the mechanism to measure its share of the Nile Water, estimated at 18.5 billion cubic meters."

He went on, "Egypt realized the danger of wasting time on the technical track in light of the intransigence of the other parties. It was important to reveal the truth after its efforts to use legal and technical arguments to support its stance in the course of the negotiations failed. A plan to take diplomatic, legal and technical action to garner regional and international support for the Egyptian position is underway."

Sudan condemned Egypt's statement. Sudanese Ambassador to Egypt Abdul Hamid Abdul Mahmoud told Al-Monitor, "Egypt's reaction stirs suspicion about the future of negotiations and does not pave the way for any sort of action, be it in the interest of Egypt or any of the negotiating parties."

He asserted, "Sudan has tried to save the technical and political negotiations, and it has the right to take the path that would serve its interests best."

Cairo did not stop with the press statement. Egyptian Foreign Minister Sameh Shoukry met with his Saudi counterpart Adel al-Jubeir on Nov. 14. The Egyptian Foreign Ministry released a press statement in the wake of the meeting, saying, "The kingdom understands Egypt's concerns over its water security and the importance of committing to the rules of international law."

Egypt's Cabinet issued a statement during its first meeting following the Nov. 15 negotiations, saying, "We will take the necessary measures on all levels, since water security is central to Egypt's national security."

Rawiya Toufic, assistant professor at the University of Cairo and researcher at the German Development Institute, told Al-Monitor, “Egypt finally admitted the failure of the technical track, which reached a dead end. ... Egypt still has to outline the next steps to overcome the crisis.”

She went on, “The Egyptian Ministry of Foreign Affairs and Ministry of Irrigation as well as the cabinet should take action in the next phase to clarify Egypt’s stance on all levels to the public at home and abroad.”

Toufic argued, “Egypt’s presidential intervention at this point will bring nothing new to the table. The presidential summit of the Nile Basin countries in Uganda in June proved that. The Ministry of Foreign Affairs and the Ministry of Irrigation should take the lead now and give a clear idea of Egypt’s stance, the concessions it expects Ethiopia to make and what Egypt can offer in return.”

On Egypt’s escalatory steps so far, Toufic commented, “Legal action at this point might not give decisive results in Egypt’s favor, because there is no tangible harm done yet. Besides, the political tools are weak amid the complex regional context. Gulf countries are preoccupied with their disputes and do not hold real cards to pressure Ethiopia. Eritrea is also fighting its own internal demons, and Sudan’s stance is known and grows firmer by the day.”

With the deteriorating negotiations that have not produced any solutions to appease Egypt’s concerns about the Renaissance Dam, the Egyptian administration has no options left but to expose the truth of what is happening at the negotiation table and focus on direct ways of coming to agreements.

But like most Egypt’s moves in the matter, any further efforts are likely to come too late, as the Declaration of Principles recognizes Ethiopia’s right and sovereignty in building and operating the dam without binding it to any written pledges to involve Egypt in the storage and operation processes.

22/11/2017 online at: <https://www.al-monitor.com/pulse/originals/2017/11/egypt-fail-renaissance-dam-negotiations-studies.html>

### **‘We have not borrowed water from anyone,’ Egypt tells Sudan**

“We have not borrowed Nile water from anyone; the High Dam was threatened because of Sudan,” said Egyptian Foreign Minister Sameh Shoukry to his Sudanese counterpart Ibrahim Ghandour, who said that “Egypt has been using part of Sudan’s share of Nile water for years”.

In response to an enquiry from the Egyptian Middle East News Agency (MENA) about the Sudanese minister’s statements, Shoukry said that “the water Egypt has previously used of Sudan’s share was a surplus to its absorptive capacity and under its approval, not an advance or a grant”.

On 21 November 2017 Ghandour told Russia Today that “Egypt has used part of Sudan’s share of Nile water for many years. That is the reason why we are worried because we will



lose that water supply when the Grand Ethiopian Renaissance Dam is finished since it will enable Sudan to benefit from its full share”.

Creditor and debtor

Shoukry described Ghandour’s arguments as “inaccurate” and expressed his astonishment and surprise at “putting things this way, and even talking about a creditor and debtor in the water relations between the two countries, which is not related to natural resources”.

Shoukry explained that “Sudan has long been using its entire share of Nile water, which is estimated at 18.5 billion cubic metres per year”.

He also said: “In previous years, the absorptive capacity of the Sudan for that share was incomplete. Therefore, there was an overflowing part of it which has been going to the river in Egypt without its will and with the consent of Sudan”.

He added: “However, this water has been a burden and a danger to the High Dam due to the unexpected increase in its storage capacity, especially at the time of the high flood, which led Egypt to discharge these excess quantities in the river or in Toshka Lakes behind the Dam, but in vain”.

He continued: “It is incomprehensible to deal with this issue at the present time amid the obstruction of studies on the impact of the Renaissance Dam on the two countries’ uses of the Nile water, and the lack of Sudan and Ethiopia’s consent on the introductory report of the technical, specialised, and impartial Advisory Bureau.”

Last week Egypt announced it has frozen technical negotiations with Sudan and Ethiopia following a tripartite meeting in Cairo after Egyptian officials rejected the two countries’ amendments to the studies of the Advisory Bureau on the Dam and its filling and operation.

Last Saturday, Egyptian President Abdel Fattah Al-Sisi said that no one could touch Egypt’s water share, stressing that it is a matter of “life or death” in his first comment after his country announced the suspension of negotiations.

Egypt fears possible negative impacts of the Grand Ethiopian Renaissance Dam on its 55.5 billion cubic metres of water, while Addis Ababa says the dam is not aimed at harming Egypt. The electricity which would be generated by the dam will help eradicate poverty and boost Ethiopia’s developmental renaissance.

23/11/2017 online at: <https://www.middleeastmonitor.com/20171123-we-have-not-borrowed-water-from-anyone-egypt-tells-sudan/>

### **Ethiopia to go ahead with multi-billion dollar Nile dam**

Ethiopia said on Saturday no amount of misunderstanding would compel it to halt construction of the \$4.8 billion mega hydro dam project on River Nile.

Seleshi Bekele, the Ethiopian minister of water, electricity and irrigation, said the Grand Ethiopian Renaissance Dam (GERD) has completed 63 percent of its construction and soon it will be generating electricity.

He was speaking at a news conference at his office in the capital Addis Ababa.

His remarks came amidst heightening tensions between Ethiopia and Egypt.

Last month, a meeting of water ministers from Egypt, Ethiopia and Sudan in Cairo ended, without reaching an agreement on the "inception report" put forth by the international consultants -- BRL and Artelia -- hired by the three countries to study the impact of the dam.

It has been six years since Ethiopia launched the GERD project, near the Ethiopia-Sudan border.

Ever since this latest unsuccessful meeting, there has been strong word coming from the Egyptian side.

Egypt fears the dam's construction will negatively affect its historical share of Nile water, which -- under a colonial-era water-sharing treaty -- stands at 55.5 billion cubic meters of water per year.

Addis Ababa says electricity generated by the dam -- which was initially slated for completion this year -- will help eradicate poverty and contribute to the country's development.

"Ethiopia cannot be bound by this treaty as it had not been a part of it," Bekeli said.

25/11/2017 online at: <http://aa.com.tr/en/africa/ethiopia-to-go-ahead-with-multi-billion-dollar-nile-dam/979412>

### **Armed group stops water pumping from Al-Hasawna site**

The Manmade River system declared the stoppage of water flow through the pipes of Al-Hasawna-Al-Jafara site, feeding the north-west cities, since Saturday.

A statement posted on its Facebook page said "We demand that the official bodies in particular and the Libyan people in general protect this vital and important project, because tampering with it threatens the national security of the nation".

This comes as a result of an attack by an armed group on Al-Hasawna site and the wells fields, demanding that it be stopped until the release of Mabrouk Hanish, who is detained in Tripoli.

26/11/2017 online at: <http://www.libyanexpress.com/armed-group-stops-water-pumping-from-al-hasawna-site/>

### **'Lack of water policy to cost Pakistan dearly'**

Participants in the international water conference on Tuesday highlighted the crucial role of water in the lives of individuals and the nation and warned of the impending shortage of water as a natural resource if steps were not taken on a war footing to stave it off.

Sponsored by the Hisaar Foundation, the two-day conference that opened at a local hotel on Tuesday morning was of the view that Pakistan direly needed a water policy which, for the present, was lacking and felt that it could cost the nation dearly if steps were not taken right away to come to grips with the situation.

The event's chief guest, Sindh Governor Mohammad Zubair, differed with some of the preceding speakers in that the impending water crisis was the biggest challenge to Pakistan, saying that in his opinion, the biggest challenge was terrorism and the energy issues.

However, he said, the government fully recognised the water problem, adding that now the government had a full-fledged water ministry. He said that lots of Pakistan's water issues stemmed from the friction-riddled ties with India and felt that there must be rapprochement at the earliest, for which he said India had to adopt a practical approach.

He said the relations between the two countries became very cordial during the Musharraf era and many of the nibbling problems came pretty close to being solved, but then things took a different turn again.

He talked of the Greater Karachi Bulk Water Supply Scheme, commonly known as the K-IV project, which he said was proceeding apace and would be functional by next year. The opening speaker, Hisaar Foundation Chairperson Zohair Ashir, said Pakistan badly needed a definite foreign policy. He was hopeful of public-private partnerships. This, he said, was a good beginning to the strategy to come to grips with an impending crisis and a positive beginning to the tradition of consultation.

He regretted that the water issue had fallen victim to the provincial and nationalistic aspects. He also lamented the apparent apathy of the federal government towards the issue and corroborated his statement by pointing to the fact that none of the federal government officials invited to the conference had turned up.

He, however, lauded the fact that the foundation's Universities for Water Network was continuing to grow and that think tanks were having profound changes on ground realities. He called for close cooperation with the media and activism of citizens, and stressed that people of the country were really supportive if there was honesty of purpose.

Rudolph Cleveringa of the Global Water Partnership said Pakistan was fast running out of water and should act before it is too late. He stressed the importance of a vision for a water-scarce world.

Good management policies in this regard, he said, were a prerequisite to private sector investment. He suggested greater engagement with banks, as "we need money". He stressed the role of literacy in management in that it would bring about a more judicious use of water.

Ghias Khan of the Engro Corporation said water in Pakistan was becoming crucially scarce, blaming poor management and lack of proper advice for it. “Climate change will affect the private sector too.”

He listed three risks to the private sector: there would be no water for farmers, flooding would disrupt crops and displace people and lack of water would affect production.

He regretted that there was no pricing mechanism. Besides, he said, there was total lack of accountability. He said that another disadvantage was the restrictions on water entitlement. “The government should focus on regulation and sustainable financing of water, as also sustainable pricing.”

Perhaps the most enlightening and gripping lecture was that of David Grey from the UK’s University of Oxford. He said that permanent peace between Pakistan and India was central to the solution of water issues between the two countries and the South Asia region at large.

He started off with human speciation, saying that Homo sapiens, the present-day human beings, evolved around 70,000 years ago in Africa, adding that the reason for this was the highly varying climatic and geographical conditions on the continent which in turn made the water pattern extremely complicated.

In northern Europe, he said, Homo sapiens evolved 40,000 years ago. He said that 97.5 per cent of the earth was ocean and only 2.5 percent dry land.

Talking about ancient civilizations, he pointed out the Nile River Basin and the Indus Basin, saying that the main reason for the existence of these advanced civilizations was the fact that they were on the banks of rivers.

He cited some of the water security challenges. In this context, he mentioned figures for India as 1 billion malnourished; irrigated yields in Pakistan and India were just 30 per cent of good performance; monsoon floods, and in this context he cited the 2007 monsoon that saw 4,300 dead and 70 square kilometers devastated in 260 districts; and drought risks.

In Balochistan, he said, two months ago a daytime temperature of 53.4 degrees centigrade was recorded, perhaps the highest ever reported on the planet. “The global spillover poses risks to stability in that it distorts urban pricing, food shortages and social unrest.”

The Syria drought, he said, displaced thousands and caused political and social unrest. Referring to the Kishanganga and Baglihar disputes between Pakistan and India, he said the two countries needed to be extended much beyond just the rivers.

22/11/2017 online at: <https://www.thenews.com.pk/print/247169-lack-of-water-policy-to-cost-pakistan-dearly>

### **Sindh governor bursts the bubble at 3rd Karachi International Water Conference**

Water is not our top priority. We are in a crisis and water is not reaching the people of Karachi, but issues of terrorism and energy are more serious and immediate problems.

Shifting from the topic at hand, this was stated by Governor Mohammad Zubair when he decided to defend the authorities' stance on trade relations, terrorism and the energy crisis in the country rather than speak on water management at the opening session of the 3rd Karachi International Water Conference, 2017 on Tuesday. Zubair was the chief guest at the event.

Organized by the Hisaar Foundation at the Movenpick Hotel, the two-day conference, which is held every two years, aims to address water issues in a bold and engaging way.

The opening plenary, 'What is the future of water in the politically challenged new world order?', was attended in large numbers by participants from Pakistan, South Asia and across the globe.

A special emphasis was placed by the presenters on the youth, inclusion of women, marginalised groups and poor communities in struggle to better manage our water resources and economy.

"You have to consider things in terms of priority. What the government has recently done is to recognise the problem," said Zubair, unmindful that the need of the hour was not realisation, but action.

He claimed to be committed to the water problem as a representative of the Centre and believed that his presence for two plus hours at the conference was testament to this commitment as he had not spend such a long time at any other event since he arrived in office.

The governor called for a breakthrough and went on to discuss foreign policy and trade relations with India at a water conference.

Disagreeing with a foreign delegate, who quoted a United Nations report that termed Pakistan's water crisis as a bigger threat to the country than terrorism, Zubair was of the view that the water problem was not as bad as terrorism.

Hisaar Foundation Board of Governors Chairperson Zohair Ashir gave the introductory remarks and highlighted the major aspects of the foundation's work, along with the growing need to effectively manage the thinning water resources of Pakistan.

He said the conference has four themes, climate change, science and technology, rights and entitlements and the water economy, with a focus on water economies.

"The salvation of our water density lies in the richness of our water economies," said Ashir.

"This is our 3rd conference. There was a time when we were barely able to attract 20 people to our meetings because water isn't sexy enough a topic to attract people. We wouldn't have any decision-makers at the meetings, but today, after much struggle, we are getting ahead and expect 500 plus people to attend the conference," he said.

We are not quite ready yet to be compared to Stockholm and Singapore's water conferences, but are taking baby steps in the right direction, according to Ashir.

He believed that most of our debates are polarised because we love diving into provincial and national aspects – shaming the government.

But what we don't realize is that we need to create a diversity of views by taking into account all stakeholders.

An area of disappointment for the foundation was the near to non-existent role of the federal government in the struggle to manage water. "Many officials were invited today from the water ministry, but have not bothered to attend," Ashir lamented.

Talking about the lack of a water policy in the country, Ashir said the foundation's think tank developed and published the Recommendation's for Pakistan's National Water Policy Framework in 2016, which is now recognized as the first 'citizen's' water policy.

As part of its dissemination campaign, the think tank has held launch sessions of the report in Karachi, Hyderabad, Lahore, Islamabad and Peshawar. As a result of these consultations, governments of Punjab, Khyber Pakhtunkwa and Sindh have started the process of drafting a provincial water policy.

"The people in this country are willing to support you if you are honest," Ashir said.

He also referred to the Panjwani-Hisaar Water Institute which was launched by Hisaar Foundation Founder Simi Kamal and NED University of Engineering and Technology Vice Chancellor Prof Sarosh H Lodhi. The first of its kind in Pakistan, the institute will work toward understanding the complexities of water. The foundation will provide technical support, Kamal said.

"Our biggest job is to equip the future generation," Lodhi said. Kamal emphasized that the time to talk about problems is over and the need for solutions is now. She questioned who has the right to water. "People feel dis-empowered," Kamal said.

The Human Rights to Water and Sanitation entitles everyone to safe, sufficient, acceptable, physically accessible and affordable water and sanitation services which we are yet to be made available. Increasing scarcity has made water governance and management critical. "Why aren't banks and financial institutions working in water?" Kamal asked.

Concluding her address on emphasising the role of women, Kamal said when we want something done, it is said give it to a busy person. However, a flip side of looking at it would be to give it to a busy woman and she will get it done.

The first presenter, Global Water Partnership Deputy Executive Secretary Rudolph Cleveringa spoke on the need for water security.

"Pakistan is out of water, we need to act now before it's too late," he said, adding that knowledge was key. Knowledge, if connected to stakeholders, can drive us to working towards water security, believed Cleveringa.

Pakistan and Hungary were the founding fathers of the global water partnership twenty years ago, Cleveringa highlighted, hoping that all dialogue over the next few days would be as 'transparent' and 'clear' as water.

Ambassador of Hungary in Pakistan Istvan Szabo stressed on transforming the lack of water into the most important political issue of today.

Hungary, he said, pays attention to the optimal use of water and is lucky to have adequate water, but 95% of it comes from outside Hungary.

Engro Corporation Limited Chief Executive Officer and President Ghias Khan talked about the role the private sector can play. He believed that companies needed to educate themselves in the water crisis. "Population growth, climate change, urbanisation, poor management, bad pricing and regulation is affecting supply and the water quality is deteriorating, Khan said.

He highlighted the risks of these factors to the private sector itself and how tackling the issue of water will be beneficial at an industrial level as well.

Giving an example of Pakistan's gas crisis, he warned of the same about water if attitudes don't change.

"The need of the hour is to have a water entitlement policy. We have no water pricing system," said Ghias, adding that water consumption must be reduced by the private sector and a partnership should be made to work on solutions with the government.

Oxford University Professor David Grey talked about the global challenges of an impending water crisis.

22/11/2017 online at: <https://tribune.com.pk/story/1564781/1-governor-bursts-bubble-3rd-karachi-international-water-conference/>

### **What will happen if the world no longer has water?**

Summer is always scorching in Amman, Jordan, but last July was particularly brutal for Tarek el-Qaisi, a mechanic who lives with his family in the eastern part of the city. A gang of thieves tapped into the power lines across from his home, and the electricity provider cut off the entire street for a fortnight. With no fans or fridges, the treeless, concrete neighborhood felt like a blast furnace. The next day, a nearby sewage pit backed up, enveloping his apartment with a sickening stench. The flies loved it, but all three of el-Qaisi's school-age children got sick. By the time his boss lowered his salary, citing slow business, the young mechanic thought nothing could faze him. "It's hell," he says, "but it's not like we have a choice."

The sudden loss of his water supply, however, has left him nearly hopeless. With no municipal water access, el-Qaisi and his neighbors have always had to rely on private tanks to service their cisterns. But recent construction at the foot of the hill on which they live has severed that lifeline. The whale-size trucks can no longer get close, so residents are now dependent on what they can carry up the steep, uneven roads. Unable to properly wash their

clothes or even clean dishes, they're slowly reconciling themselves to a world with almost no water. "I come home dirty and sometimes can't wash," says el-Qaisi, his arms and face flecked with sweat and motor oil. "It's humiliating. No one should have to live like this." [Keep Up With This Story And More By Subscribing Now](#) [Supply and Demand](#)

Without drastic action, many Jordanians may share his plight. The Jordan River, the country's lone waterway, is dirty and depleted, while some of its aquifers have been pumped almost beyond repair. The nation's annual rainfall is set to slide dramatically due to climate change, even as its population continues to swell. Jordan is too poor to turn to costly, large-scale desalination—or fix its leaky infrastructure. And the country's population growth shows few signs of slowing, so it can't fall back on water imports, as some lightly populated Pacific and Caribbean island nations have done. Water shortages have gotten so bad, they've already sparked clashes between refugees and native Jordanians, and the officials charged with catering to booming demand with a shrinking supply are beginning to panic. "We have to look outside Jordan," says Ali Subah, secretary-general for strategic planning at the Ministry of Water and Irrigation. "There are no more water resources here."

Jordan could be the first country to run out of water, but it likely wouldn't be the last. Globally, water demand is forecast to rise by roughly 50 percent by 2050. And the situation is dire on the supply side too: 21 out of the world's 37 biggest aquifers are already moving past their tipping points, according to NASA, in part due to over-extraction for drinking water and mining. Meanwhile, global warming appears to be reducing rainfall in some places. Two out of every three people will face water shortages by 2025, the World Meteorological Organization says, and hundreds of millions more might grapple with dangerously poor water quality.

Overwhelmed by the challenge of supplying their swelling populations with often shoddy infrastructure, many of the planet's megacities are particularly at risk. Four billion people currently live in urban areas, a total that's expected to almost double by the middle of the century. Nairobi, Kenya, almost ran dry this summer, while Cape Town, South Africa, is in the throes of its worst drought in many years. Tehran, Iran, looks set to introduce water rationing soon. And in the U.S., too, water managers in 40 states expect water woes over the next decade. At best, water shortages could set the global economy back \$500 billion a year, according to the World Bank. At worst, they could lead to war and terrorism. As a comprehensive 2012 U.S. intelligence report put it: "The use of water as a weapon or to further terrorist objectives also will become more likely beyond 10 years."

In the Middle East, that warning is especially worrisome in the aftermath of the 2011 Arab Spring revolts. As in much of the region—and the world—most of Jordan's water, at least 65 percent, goes to agriculture. And some officials recognize that this is unsustainably high. "We can't tell the next generation that we lost all your water because we grew too many tomatoes," a senior royal courtier said on the condition of anonymity, as he was not authorized to speak to the press. In the royal palace, a heavily wooded and guarded swath of central Amman, teams of specialist advisers pore over the country's options. But in a precarious region, policymakers are loath to surrender all food production. "In some ways, this has happened



since time immemorial,” says Aaron Wolf, a professor of geography and noted water expert at Oregon State University. “If you’re rich, you resolve [the crisis]. If you’re poor, you die.”

Jordan has never had much water. But for most of history, its relatively few inhabitants got by. Seventy years of mopping up its much larger neighbors’ mess changed all of that. First, several hundred thousand Palestinian refugees fled over the border following the creation of Israel in 1948, two years after Jordan’s founding, almost tripling the new state’s water requirements overnight. Then waves of Lebanese, Iraqis and more Palestinians followed over the subsequent decades, each adding to the burden. Many refugees from war-ravaged Libya and Yemen also moved to Amman in recent years. By the time the civil war in Syria worsened in 2013, ultimately saddling its southern neighbor with over a million of its thirsty citizens, there was almost no Middle Eastern nationality Jordan hadn’t hosted.

Native Jordanians have played their part in the population growth too. The country has a fertility rate of 3.38, one of the highest in the region.

This population boom alone, however, didn’t doom Jordan’s water supply, government strategists say. (Though they insist the Syrian refugees, who come from a less arid land, have little understanding of water conservation practices.) But with much of the growth coming in sudden influxes, authorities have been unable to properly plan from one year to the next.

And so, as Jordan’s population has continued to outpace all projections, besting the 2035 forecast of 9 million as early as 2015, stunned officials have resorted to raiding all water sources in sight—to devastating effect. Ten of the country’s 12 aquifers are now almost depleted, says Maysoon Zoubi, head of the Higher Population Council and a former secretary-general of the Ministry of Water and Irrigation. In some places, water engineers are drilling down over a mile in pursuit of new discoveries. Authorities don’t have a choice, experts say. “The water quality is going down, the water quantity is going down, but you need to provide water for people,” says Raed Nimri, a water expert at Mercy Corps and deputy head of Water Innovations and Technologies, a U.S.-funded water-saving program. “This is a national security issue.”

At 90 cubic meters per person per year, one of the lowest per capita water shares in the world, Jordanians enjoy about 3 percent of Americans’ consumption. But the country is far from blameless regarding its water plight. Perhaps half of all extracted water is lost to leaky pipes; in some otherwise dry districts of Amman, gushing jets of freshwater irrigate the concrete. It’s a self-inflicted wound of crippling proportions. Because of holes in the distribution network, water station operators have to pump furiously to maintain pressure in the pipes, so more is squandered in transit. In fact, almost 20 percent of Jordan’s electricity goes to pumping and circulating water around the country, according to the Ministry of Water and Irrigation. Despite this massive expense, the flow is often so feeble by the time it reaches residents, many of whom receive municipal water access only every few weeks, they don’t have enough time to fill the rooftop tanks they use to tide themselves over until the next delivery. “The streets are getting the water we need!” says Samir Kukh, a retired civil servant, who lives in the capital’s Bayader neighborhood.

Theft is also exacting a heavy toll. For decades, a wealthy and connected cabal of major families and tribal leaders have exploited Jordan's water resources. Conscious of the monarchy's dependence on their political support, they've helped themselves to torrents of free water without fear of reproach. "There's political interference because some of the big families have their farms," says Zoubi. At least 30 million cubic meters are lost to illegal wells every year, according to the Ministry of Water and Irrigation, though independent experts suspect the total might be much higher.

So at the same time as severe water shortages pitch Syrian refugees and Jordanians into conflict with each other, particularly around Ramtha in the north, these powerful landowners are guzzling groundwater. "In a country that might run out of water," says Mohammed Atiyeh, a farmer in the southern Jordan Valley, "there is regulation only for the weak and poor."

### Praying to God for Help

Located in the valley, with its famously fertile soil, several hundred meters below sea level, Atiyeh's farm ought to be blooming. But with a water supply that's one-fifth as salty as seawater, he can't grow anything but sickly looking palm trees. And with his neighbor, a scion of one of the area's leading families, hoarding what's left of the freshwater to irrigate his banana trees, Atiyeh worries he might soon be unable to grow anything at all.

Others face a far direr situation. Several miles to the south, along the Dead Sea, sinkholes have already consumed some fields. With next to no Jordan River water now reaching the lake, the lowest place on Earth, surface levels are falling by around a meter a year, taking everything from roads to rice crops with them. At some spas on the Israeli side of the Dead Sea, operators now rely on tractor-drawn trailers to ferry guests over half a mile to the beach.

Because of climate change, Jordan's water shortage could soon get dramatically worse. The little rain the country receives is projected to drop 30 percent by the end of the century, according to Stanford University's Jordan Water Project. Soil will dry out, reducing yields. As supply hits new lows and demand soars—particularly in agriculture, as much higher temperatures lead to more evaporation and thirstier crops—even royals are bracing themselves for trouble. "Although Jordan contributed very little to the imminent impact of climate change, it is nevertheless expected to suffer on a much higher level compared to other countries," says Prince Hassan bin Talal, the king's uncle and former chairman of the U.N. Secretary-General's Advisory Board on Water and Sanitation. Even with present levels of precipitation, Jordan has never filled more than 60 percent of its dam and reservoir network.

And then there's the continued fallout from the kingdom's unfortunate topography. Downstream of Syria and Israel, and with its biggest aquifers spanning the Saudi and Syrian borders, Jordan has always been at the mercy of its neighbors' water policies. Since the 1950s, dam construction and agricultural expansion in Syria have cut the volume of the Yarmouk, the Jordan River's principal tributary, by at least 60 percent. The Wehda Dam, Jordan's big barrage on the Yarmouk, has rarely been more than a quarter full. But authorities in Amman haven't seen anything yet, Stanford researchers say. Regionwide drought and

upstream population growth could shrink Jordan's share of the Yarmouk up to 75 percent by 2050, while likely further cutting its groundwater access. With less rain, little river water, more people and already ailing aquifers, the numbers are no longer adding up. "We are praying to God for help," says Sobhi al-Abadi, one of an estimated 30,000 water tank drivers who service unconnected homes and businesses across the capital area. "Because nothing [else] will help us here."

Every morning, starting at 4 a.m., he and dozens of other truckers wait up to five hours to fill their tanks at Sharat, a well just south of Amman. From there, they spread out across the city, waiting for their phones to ring. Most neighborhoods have at least five or six wait stations, where the drivers can pull up and doze. But each year, business gets more challenging, al-Abadi and his colleagues say. Gas prices have gone up, raising their costs, at the same time as the "big families" with their private wells undercut the market. It's seemingly only the brutal summer heat, which boosts demand, that enables them to break even. "We thought this was a safe job because if someone runs out of water, they're going to do everything they can to buy more," Abadi says. "We're not so sure anymore."

### Attacking the Crisis

Jordan does, however, have a few earthly options. The state is getting more serious about tackling the causes of its crisis—from launching family-planning campaigns to raising water prices and cracking down on bigwig water barons. "Some people will still be above the law, but there has been a drive to reduce their number and hopefully their impact," says Samer Talozzi, a professor at the Jordan University of Science and Technology and member of the Stanford Water Project. Residential water prices have already gone up threefold over the past few years, from around \$8 to \$25 per quarter, though the World Bank says water is still underpriced. Aid and development organizations, like Mercy Corps, have even enlisted imams to encourage water conservation in their Friday sermons.

And there are some signs that the state is finally recognizing the necessity of reforming its agricultural sector. Already, about a quarter of farms operate off treated wastewater; there are plans to double that figure. Making the move away from conventional crop cultivation toward hydroponics and other water-saving farming techniques, as most experts believe the kingdom must eventually do, will be politically complicated, but Jordan has the necessary top-down system to pull it off. "If the king supports something, that means the Cabinet supports something," says Subah, the water and irrigation official.

In a rocky, windswept portion of the southern Jordanian desert, the Sahara Forest Project, a Norwegian venture, offers something of a template for how Jordan might maintain some food production despite its water shortage. Its model, one of the first of its kind in the world, involves piping water from the nearby Red Sea, desalinating it with solar-powered technology and then recycling it among greenhouses. With no ground, rain or surface water, they envisage growing an initial 130 tons of vegetables a year.

These reforms are necessary, but in the long term, none will be sufficient to make up for Jordan's water deficit, particularly if, as is the country's experience, the Syrian refugees don't

go home. Jordan's current water budget is a little under a billion cubic meters, but by 2025, it's forecast to hit at least 1.4 billion. Only large-scale desalination, it seems, will give the kingdom a chance to satisfy its needs. "At one point, it has to happen," says Nimri of Mercy Corps. "If you want to come to a point where you don't run out of water, it has to happen." One of the most ambitious schemes, known as the Red to Dead project, involves taking water from the Red Sea, desalinating it and dumping the brine into the Dead Sea to slow its disappearance.

But for these grand plans to work, Jordan, already one of the biggest beneficiaries of American assistance, is going to need a lot more outside help. The U.S. Agency for International Development has spent over \$800 million on water projects in Jordan since 2000. The government in Amman is more or less broke, while the country's layout—with a short coastline that's downhill and a long way away from the main population centers—is uniquely ill-suited to cost-effective desalination. "The massive investment required to act...exceeds Jordan's resources by far," says Prince Hassan. "The help of the international community is essential to overcome the water problems."

Still, few would bet against the kingdom. It has displayed remarkable survival instincts in the past, remaining stable as its neighbors have wobbled. Even when faced with its greatest challenge, there's reason to believe it can do it again. "We're a country of refugees," says el-Qaisi, the water-deprived mechanic, showing off a modified shopping cart with which he and his neighbors plan to ferry large tanks of water up their hill. "And refugees," he adds, "are survivors."

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