



# 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

*16 March 2015 – 22 March 2015*

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❖ **Union: Turkey needs to be on alert for drought**

**Turkey has to be on the high alert to preserve its sources of potable water and encourage people to save water before the reservoirs dry out, a local agriculture union warned on Sunday.**

Sunday's written statement over potential water shortage risks for Turkey from the Turkish Union of Agricultural Chambers (TZOB) coincides with World Water Day on March 22.

Water reservoir volumes have reached critical low levels across Turkey due to the lack of precipitation last year, causing great concerns about a prolonged water shortage crisis. “Contrary to popular belief, Turkey is not a water-rich country and substantial moves need to be made for the protection of Turkey's water sources,” the TZOB urged in its statement on Sunday. The union said that according to global standards, countries with an annual per capita usable water supply of 1,000 cubic meters or less are considered water-poor while those that have between 1,000 and 2,000 cubic meters are considered to be suffering from a water shortage.

According to the Turkish Statistics Institute (TurkStat), Turkey's population is expected to reach 100 million by 2030. Considering this potential population number, the annual amount of usable water per person is estimated to be 1,120 cubic meters per year in Turkey by 2030. The TZOB said only countries that can provide more than 8,000 cubic meters per capita in a year can be considered water-rich, and that Turkey is not in this league.

According to a report provided by the World Wide Fund for Nature (WWF) last year, Turkey is not a water-rich country, and has an annual per capita water supply of only 1,430 cubic meters. According to the report, the country's water resources will be used to full capacity by the year 2030. The same report says Turkey will face irredeemable water shortages, especially after 2050, if it continues to consume from its available water sources at its current speed.

**Food security threatened**

Water demand in Turkey nearly doubled in the second half of the 20th century, and overall water demand accelerated at a greater pace than ever between the years 2000 and 2014. More than 70 percent of the water supply in Turkey is used for agricultural irrigation, and the remainder is used for drinking, domestic and industrial use, State Waterworks Authority (DSİ) figures show.

The TZOB statement said on Sunday that rapid industrialization has brought about the contamination of water sources in different parts of Turkey, and this has adverse effects on agricultural irrigation and thus food security. Drought in the east and southeast threaten reservoirs in a crucial area, as many of Turkey's main hydroelectric plants are located in those regions, generating power from dams built around the Tigris and Euphrates rivers.

The TZOB says the government should concentrate on developing effective and technological means of irrigation. The lack of water has economic costs and causes deep concerns among agricultural producers, the union adds. Drought, which dealt a big blow to the supply of food products last summer, brought about an increase in the prices of almost all food products and triggered a hike in inflation rates in the following months in Turkey.

Water loss rates in Turkey are much higher than those in developed countries, which spend millions of dollars on projects to reduce water loss every year, earlier reports show. The situation has deteriorated this year in particular, and İstanbul has been experiencing periodic water cuts since June.

“Union: Turkey needs to be on alert for drought”,22/03/2015, online at: [http://www.todayszaman.com/business\\_union-turkey-needs-to-be-on-alert-for-drought\\_375972.html](http://www.todayszaman.com/business_union-turkey-needs-to-be-on-alert-for-drought_375972.html)

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### ❖ ‘Real and effective’ collaboration key to mitigating IS water threat

WATER Since bursting onto the scene in summer 2014, the militant group Islamic State (IS) has wreaked extensive damage, destruction and death across a large swathe of Syria and Iraq. Much focus has been placed on the group’s acts of extreme violence. But far less has been said about another form of violence, less obviously bloody but perhaps more even more dangerous. Samantha North reports.

Not content with forcefully imposing its twisted version of Islam on local populations in Iraq and Syria, IS has also exerted control by other means. The group has captured a number of vital water resources in the region, wresting control of the people by holding their water supply hostage. IS water control has had other devastating effects in an already dry and arid region. Water shortages have destroyed agricultural land in the rural areas and caused electricity loss in the cities. Combined, this has meant severe setbacks for the region’s economy.

Taking control of the water has enabled IS to completely subjugate local populations, which are heavily dependent on water supplies. Before IS arrived, previous droughts and water shortages have produced an already fragile relationship with water, leaving people with little choice but to comply with IS demands.

IS HAS SHOWN considerable imagination in terms of water control. In September 2014, according to the recent report *Water and Violence* by Mumbai-based consultancy Strategic Foresight Group, IS militants reportedly used chlorine as a chemical weapon against Iraqi soldiers near Baghdad. They had extracted the deadly gas from captured water treatment plants in Iraq. Although this approach is not new in itself, it is a first for IS. The development shows that the group is now taking a different approach to water: using it not just as a tool but also as a weapon.

"Taking control of the water has enabled IS to completely subjugate local populations"

The water situation in Syria and Iraq has taken a back seat in global media coverage, which has tended to focus on the more conspicuous and bloody elements of IS activities. Although water warfare perhaps offers less dramatic storylines, it nevertheless poses an existential threat that is equal if not more serious in the long-term than the violent attacks that make daily headlines.

Use of water as a weapon is not a new phenomenon in the Middle East. In 1960s Syria, Israel bombed the infrastructure of the Jordan River in order to divert its water. Various water-related attacks continued throughout the following decades, across Lebanon, Iraq, Turkey, and Jordan. According to *Water and Violence*, water-related attacks have ranged from poisoning the water supply (as the PKK did in 1992, when they put potassium cyanide in the water tank at a Turkish air force base), to bombing of dams, canals, roads and power plants, and the burying of toxic waste.

**IS BEGAN TO USE** water as a strategic weapon back in November 2012, when it captured the Tishrin Dam in Syria. Since then, the group has repeated similar strategies to gain control over Mosul, Samarra and Fallujah. IS considers water and water infrastructure not just as important tools of expansion and extortion, but also as valuable financial assets and efficient instruments for waging war.

The group has already caused significant damage in western and southern Iraq by closing the gates of the Fallujah Dam on the Euphrates. It has controlled this dam since the beginning of 2014. Although IS has not yet resorted to repeating this approach in Syria, the potential is certainly there.

“The scope for IS mischief-making with Syria’s water is enormous. Among the many things that they could do would be to mess up the country’s flagship Euphrates Dam. That this hasn’t happened so far is no guarantee that there won’t be some water-terrorism catastrophe instigated by them in the near future”, said Riad al Khouri, Jordanian economist and researcher on Syria.

Experts in water and security, who gathered at the Blue Peace Forum last week in Amman to discuss the region’s water problems, agreed that improving cross-border co-operation in general would be an important first step towards mitigating the IS threat.

Maysoon Zoubi, former director general of the Jordanian Ministry of Water and Irrigation, commented: “The best solution to IS is establishing real and effective collaboration.”

“Real and effective’ collaboration key to mitigating IS water threat”, 22/03/2015, online at:  
[http://www.yourmiddleeast.com/culture/real-and-effective-collaboration-key-to-mitigating-is-water-threat\\_30816](http://www.yourmiddleeast.com/culture/real-and-effective-collaboration-key-to-mitigating-is-water-threat_30816)

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## ❖ Water cooperation key to ensuring peace

*Experts highlight critical need for working out plans internationally for equitable use of resources*

Amman: Cooperation between countries on issues concerning water has become a modern necessity. This was how John Roa Nyaoro, Executive Director of the Nile Basin Initiative in Kenya, began his address at the conference on ‘Exploring the water-peace nexus — Blue peace in West Asia’ held in Amman on March 18-19.

Nyaoro said he believes there is still hope to address the water insecurity situation in the Middle East. He referred to the Nile Basin initiative, which was launched in 1999 to promote dialogue and cooperation among nine countries in Africa that share the river’s resources. Egypt, Sudan, Ethiopia, Uganda, Kenya, Tanzania, Burundi, Rwanda, and Democratic Republic of Congo continue to be bound by the accord to date.

“If regional cooperation in water resources is possible in the Nile River, the most complex and longest river in the world with a length of 6,700 km, then it is possible in the Middle East,” Nyaoro said.

Water cooperation plays a major factor in the region’s development, and has become a matter of urgency. The latest ‘Hydro insecure: Crisis of Survival in the Middle East’ report that was launched by Prince Al Hassan Bin Talal at the conference, shows that the total population of five countries — Iraq, Syria, Jordan, Lebanon, Turkey — is roughly 140 million, out of which 40 million people are hydro-insecure. Turkey hosts the highest number of people facing such difficulties, with around 30 per cent or 11.8 million of the total 40 million hydro-insecure population — making 17 per cent of the Turkish population hydro-insecure.

Nyaoro said the need for negotiations between countries who share a water resource is essential not only for sustainable development, but also due to its role in solving conflict and ensuring peace in the region. “Countries need to put mechanisms in place that allow all basin states equitable and reasonable utilisation of scarce water resources,” he said.



Reports show that any two countries engaged in active water cooperation do not go to war for any reason whatsoever. Common obstacles that countries face in cooperation pacts relating to water resources include climate change, insufficient water infrastructure, mistrust between states, and the use of water as a weapon.

Nyaoro also referred to the UN's 1997 water convention, which states that countries have the right to utilise any shared resources in their territory as long as they don't cause significant harm to basin states. According to international laws, all countries — whether a member of the convention or not, must cooperate by allowing the utilisation of shared water resources, explained Nyaoro. “This also applies during conflict, war, and political turmoil. An environmental impact assessment should also be conducted for every project, and shared with basin states to maintain resource management.”

Fearing the possibility of a world war based on water, Nyaoro discussed steps that can be followed by every country to include all parts of the community in the management of resources. “Cooperation brings about trust,” he said.

Empowering local communities through education and awareness about the reality of water scarcity is one of the first steps, he said. Community empowerment must be backed up with a mandate on the national and regional level in order for it to work, he added. “When there's an agreement, there is a budget and the community can be empowered through activities that help in the management of this scarce resource.”

Meanwhile, Helena Rietz, the Swedish Ambassador to Jordan, highlighted that women and children are the worst-affected members of society in times of conflict and lack of accessibility to water. “We need to strengthen the role of women and empower them for truly inclusive water cooperation,” she said.

Inaccessibility to water impacts agriculture along with people's livelihood, households, and health, Rietz added.

“Women and children should be included in water programmes and given the highest priority as they are the most vulnerable when it comes to water scarcity,” she said.

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She pointed out that conflict resulting in massive displacement of people and violations of human rights has become too common in the region today. “We all have a role to play in the way forward. The future of water is in our hands and the time to move is now.”

“Water cooperation key to ensuring peace”, 22/03/2015, online at: <http://gulfnews.com/news/uae/environment/water-cooperation-key-to-ensuring-peace-1.1475648>

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### ❖ New age of water wars portends 'bleak future'

The world is already in the throes of an epidemic of local and regional water shortages, and unless this trend is reversed, it will lead to more forced migrations, civil unrest and outbreaks of conflict. Behind the escalating violence in Iraq, Syria and Yemen, as well as the epidemic of civil unrest across the wider region, is a growing shortage of water.

New peer-reviewed research published by the American Water Works Association (AWWA) shows that water scarcity linked to climate change is now a global problem playing a direct role in aggravating major conflicts in the Middle East and North Africa.

Numerous cities in Latin America, Africa, the Middle East, North Africa and South Asia are facing “short and declining water supplies per capita,” which is impacting “worldwide” on food production, urban shortages, and even power generation.

In this month’s issue of the Journal of the AWWA, US water management expert Roger Patrick assesses the state of the scientific literature on water scarcity in all the world’s main regions, finding that local water shortages are now having “more globalised impacts”.

He highlights the examples of “political instability in the Middle East and the potential for the same in other countries” as illustrating the increasing “global interconnectedness” of water scarcity at local and regional levels.

In 2012, a US intelligence report based on a classified National Intelligence Estimate on water security, commissioned by then Secretary of State Hillary Clinton, concluded that after 2022, droughts, floods and freshwater depletion would increase the likelihood of water being used as a weapon or war, or a tool of terrorism.

The new study in the Journal of the AWWA, however, shows that the US intelligence community is still playing catch-up with facts on the ground. Countries like Iraq, Syria and Yemen, where US counter-terrorism operations are in full swing, are right now facing accelerating instability from terrorism due to the destabilising impacts of unprecedented water shortages.

## Thirsty people, failing states

The UN defines a region as water stressed if the amount of renewable fresh water available per person per year is below 1,700 cubic metres. Below 1,000, the region is defined as experiencing water scarcity, and below 500 amounts to “absolute water scarcity”.

According to the AWWA study, countries already experiencing water stress or far worse include Egypt, Jordan, Turkey, Iraq, Israel, Syria, Yemen, India, China, and parts of the United States.

Many, though not all, of these countries are experiencing protracted conflicts or civil unrest.

The AWWA is an international scientific association founded to improve water quality and supply, whose 50,000 strong membership includes water utilities, scientists, regulators, public health experts, among others. AWWA operates a partnership with the US government’s Environment Protection Agency (EPA) for safe water, and has played a key role in developing industry standards.

Study author Robert Patrick, formerly of PriceWaterhouseCoopers, is a government consultant and water management specialist who has worked on water scarcity issues in Jordan, Lebanon, New Mexico, California and Australia.

His Journal of AWWA paper explains that the grain price spikes that contributed to Egypt’s 2011 uprising, were primarily caused by “droughts in major grain-exporting countries” like Australia, triggered by climate change.

Patrick points out that such civil unrest could signal an Egyptian future of continuing unrest and conflict. He highlights the risk of war between Egypt and Ethiopia due to the Grand Ethiopian Renaissance Dam, threatening to restrict Egypt’s access to the Nile River, which supplies 98% of Egypt’s water supply.

As Egypt’s population is forecast to double to 150 million by 2050, this could lead to “tremendous tension” between Ethiopia and Egypt over access to the Nile, especially since Ethiopia’s dam would reduce the capacity of Egypt’s hydroelectric plant at Aswan by 40%.

## Water wars and the ‘war on terror’

The nexus of countries in the Middle East and North Africa where the United States is currently leading a multi-year military engagement against the “Islamic State” (IS) all happen to be drought-stricken.

Before Syria erupted into ongoing civil war, Patrick reports, 60% of the country went through a devastating drought that led over a million mostly Sunni farmers to migrate to coastal cities dominated by the ruling Alawite sect, fuelling sectarian tensions that culminated in unrest and a cycle of violence.

A new paper in *Proceedings of the National Academy of Sciences* has provided the most compelling research to date on how climate change amplified Syria’s drought conditions, which in turn had a “catalytic effect” on civil unrest.

But Patrick’s concern is that the Syria crisis could be a taste of things to come. Citing the findings of the Gravity Recovery and Climate Experiment (GRACE) sponsored by NASA and the German Aerospace Centre, he notes that between 2003 and 2009, the Tigris-Euphrates basin comprising Turkey, Syria, Iraq, and western Iran “lost groundwater faster than any other place in the world except northern India”.

A total of 117 million acre-feet of stored freshwater was lost due to reduced rainfall and bad water management. If this trend continues, “trouble may be brewing” for the region.

Yemen is also consuming water far faster than it is being replenished, Patrick observes, an issue that has been identified by numerous experts as playing a key background role in driving local inter-tribal and sectarian conflicts.

Syria, Iraq and Yemen are currently subjected to ongoing US military operations under the rubric of fighting Islamist terrorists, yet the new AWWA study suggests that the rise of Muslim extremist movements has been indirectly fuelled by regional water crises.

The ravaging impact of climate change in these countries has devastated local agriculture, heightened community tensions, and stoked already entrenched political grievances. With huge quantities of money pouring into the region to Islamist militant networks from the Gulf states, this is an ideal recipe for violent radicalisation.

As US meteorologist Eric Holthaus points out, the rapid rise of the “Islamic State” (IS) last year coincided with a period of unprecedented heat in Iraq, recognised as being the warmest on record to date, from March to May 2014. Recurrent droughts and heavy rainstorms have also played havoc with Iraq’s agriculture. With water supplies dwindling, and agriculture waning, the Iraq’s US-backed Shiite-dominated government has largely failed to address these burgeoning challenges, even as IS has moved quickly to exploit these failures, for instance by using dams as a weapon of war.

### **Escalating trend**

But water scarcity does not make conflict inevitable. While water has played a role in Israel’s conflicts with its neighbours in the past, Patrick argues that through a combination of efficient water management methods and desalination technologies, Israel has been able to successfully cooperate with Jordan on their shared water resources for many years.

This is, of course, a one-sided picture. While Israel does not want for water, the UN has warned that Gaza could become “unlivable” due to its worsening water crisis. Ongoing water shortages throughout the Occupied Territories are rooted in discriminatory policies of resource theft by the occupying power, including Israel’s effective forced privatisation of the Palestinian water supply.

These disparate cases show that while, theoretically, efficient water management and distribution methods can offset crises and continue to meet local needs, government mismanagement combined with regional power inequalities and repressive policies can be a precursor to social breakdown and violent conflict.

The AWWA study’s findings have been backed up by other recent studies. One from this January in *Global Affairs*, the journal of the European International Studies Association, argues that all four of the world’s most significant hotspot regions for major conflicts – the Sahel, the Middle East, Central Asia, the coastal zones of East, South and Southeast Asia - are increasingly unstable due to constellations of “water scarcity; loss of land; and food insecurity”. The paper, which calls for greater European support to these regions to mitigate trends of environmental degradation, is authored by Hartmut Behrend, a climatologist with the German military’s Agency for Geo-information.

The symbiotic link between modern agriculture and water consumption poses the biggest global risk, according to Roger Patrick. Water scarcity is driven predominantly by the increasing use of groundwater in agriculture. Yet across most of the world’s major food basket regions, including the

Central Valley in California, northern China and the Upper Ganges in India and Pakistan, “demand exceeds their aquifers’ sustainable yields,” by some estimates 3 and a half times as much.

By 2035, global water consumption is predicted to increase by 85%. Much of this growth will be driven not just by agricultural expansion, but also by greater demand for energy. Biofuels are particularly water intensive, but hydraulic fracturing (“fracking”) for unconventional oil and gas also uses large amounts of water.

That need for water is “already constraining such energy production in locations such as Australia, Bulgaria, Canada, France, and the United States”. In especially water scarce parts of China, India and the US, as well as Canada and Iraq, this threatens to seriously undermine power generation in the long-term. It also raises the question of whether the developed world has sufficient resilience to avoid the sort of instability that is now plaguing large swathes of the Middle East and North Africa.

Another scientific study just out this month in Environmental Science: Water Research and Technology, published by the Royal Society of Chemistry, similarly concludes that due to our dependence on water-intensive fossil fuel and nuclear energy sources, the global water footprint will only continue to increase in tandem with population growth and demand. Ironically, the expansion of such traditional energy sources, by escalating the demand for water, will only worsen the prospects for stable power generation. The most effective way to address this challenge, the study finds, is a shift to “greater shares of wind, [solar photovoltaic] PV, and geothermal energy”.

### **First world problems**

Although less developed regions are most vulnerable to the impacts of climate-induced water scarcity, richer Western countries and emerging industrial economies are increasingly feeling the heat.

California’s record 15-year drought, the AWWA study shows, has been accompanied by the depletion of 41 acre-feet of groundwater and 12 million acre-feet of surface water. When the groundwater runs dry, and if the drought persists, US farming will collapse. The potential onset of an El Nino might lead to a return of rain that could alleviate this problem, at least temporarily, but even so, the long-term trend looks grim.

But it is not just the US, India, and Pakistan’s collective water footprint from pumping water in the Upper Ganges basin is 54 times the area of the aquifer itself. In India, a major regional power and emerging economy, at current rates of consumption, 60% of the country’s aquifers will be in “critical condition” in just two decades. Given that consumption is pitched to increase driven by economic and demographic growth, this could happen much earlier. This could be a risk not just to the internal social cohesion of both India and Pakistan, both of which already face significant tensions along ethno-religious lines, but to their considerably strained diplomatic relations.

China also faces a serious water crisis, according to the AWWA study. Although half its population and two-thirds of its farmland are in the north, 80% of the country’s water is in the south. The 70% of groundwater in the north is too unfit for human contact, let alone use in agriculture or industry. Yet half the country’s wheat for domestic consumption is produced in the north. In just five years, an estimated 30 million people in China will be displaced due to water stress.

Defence analysts believe that regional water scarcity could increase the risk of conflict between India and China. In the US, the drought-ridden Colorado River basin is shared by seven US states and Mexico - rivalry over control of water is largely political for now, but this could change.

In 2008, a report by the US Army War College’s Strategic Studies Institute suggested that the US military must prepare for a “violent, strategic dislocation inside the United States” due to a “loss of functioning political and legal order” - triggered potentially by environmental, energy or economic shocks.

This “bleak future” is not inherently inevitable - but it is on our current path.

- *Nafeez Ahmed PhD, is an investigative journalist, international security scholar and bestselling author who tracks what he calls the 'crisis of civilization.'* He is a winner of the Project Censored Award for Outstanding Investigative Journalism for his Guardian reporting on the intersection of global ecological, energy and economic crises with regional geopolitics and conflicts. He has also written for *The Independent, Sydney Morning Herald, The Age, The Scotsman, Foreign Policy, The Atlantic, Quartz, Prospect, New Statesman, Le Monde diplomatique, New Internationalist.* His work on the root causes and covert operations linked to international terrorism officially contributed to the 9/11 Commission and the 7/7 Coroner’s Inquest.



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*The views expressed in this article belong to the author and do not necessarily reflect the editorial policy of Middle East Eye.*

“New age of water wars portends 'bleak future’”, 19/03/2015, online at: <http://www.middleeasteye.net/columns/new-age-water-wars-portends-bleak-future-804130903>

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## ❖ Iran's leaders react to the nation's massive environmental challenge

In 2013, Issa Kalantari, a former agriculture minister, claimed Iran was becoming uninhabitable. The threat, he said, was “more dangerous” than Israel or the United States.

Since then, a succession of environmental crises has prompted Iran's leaders to examine the country's chronic management of water, land and air. With dams only 40% full, President Hassan Rouhani has urged Iranians to cut their water use by 10%. Major rivers such as Karun and Karkheh in the south-west have fallen to a trickle, while the Zayandeh-Rud in the historical city of Isfahan frequently runs dry. Lake Urmia, the Middle East's largest salt-water lake, in north-west Iran, has shrunk by about 90% during the last decade.

Rapidly thinning forests are causing land degradation due to the loss of fertile top soil. In February, dust storms halted everyday life in Iran's south-west as dust particles in the air reached 66 times safe limits. Parliamentary representatives from Khuzestan province lambasted the department of environment for its failure to confront the problem, wearing medical masks to show solidarity with their constituents.

It was a telling piece of theatre, even if it ignored the role of parliament over decades in promoting or supporting development projects that have been a major cause of the environmental disaster. And parliamentary speaker Ali Larijani did urge environmental experts to cooperate closely with the parliament's research centre and expert commissions to improve decisions and law-making. Larijani referred to Article 50 of the constitution, which describes preservation of the environment as a “public duty” and forbids “economic and other activities that inevitably involve pollution of the environment or cause irreparable damage to it”.

Early this month President Rouhani stressed that the dust storms had made “environmental problems....more tangible now than ever before”.

Ayatollah Ali Khamenei, the supreme leader, has demanded action. During this year's National Week of Natural Resources (7-13 March), which symbolises the nation's appreciation of nature, the leader told officials and activists that “the issue of the natural environment is not related to this and that government, person and [political] orientation” but was “a national issue” which “everyone

should join hands” to address. Drawing on religious teachings on the importance of environmental conservation, Ayatollah Khamenei expressed concern as to whether sufficient consensus and collaboration existed among different government bodies, and demanded the preparation of a “national environmental plan for all construction and industrial projects”.

In particular, the leader instructed officials to confront harmful construction plans including tourist resorts and religious seminaries. He stressed the criminal nature of ill-conceived clear-cutting of forests, land and water grabbing, and the large-scale acquisition of public land and water resources for private use and profit. Further, he underscored the importance of public education and engagement.

This is all an encouraging start, but the scale of the challenge is huge. Dramatic change is required in both public perceptions and the whole way in which government manages the environment.

The department of the environment does not have equal standing with more powerful bodies in charge of development projects, such as the ministry of energy, the ministry of roads and urban development, and the oil ministry. Yet despite environmental issues often being marginalised, the department of environment bears the brunt of criticism when problems occur. And business as usual tends to return once an immediate crisis subsides.

Recognition of environmental problems at the apex of Iran’s political power structure can provide a spur to a long-overdue reform. An overarching national environmental plan, with strong legal backing, is critical to ending a fruitless blame game among state bodies. Such a plan could shift Iran away from responding to crises with last-minute panicky solutions towards tackling the social, economic, and political roots of problems.

Iran risks an alarming future of drying rivers and wetlands, declining groundwater, deforestation, soil degradation, biodiversity losses, dimming haze, and dust storms rising from parched lands. But the unprecedented sense of urgency in Iran’s political leadership presents an opportunity for officials, activists and all Iranians to improve the shaken balance between humans and nature.

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“Iran’s leaders react to the nation’s massive environmental challenge”, 18/03/2015, online at:  
<http://www.theguardian.com/world/iran-blog/2015/mar/18/irans-leaders-react-to-the-nations-massive-environmental-challenge>

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

### ❖ Refugees exacerbate water crisis in Middle East

Influx of people displaced by conflicts across borders has led to an increase in the number of water-insecure areas

Amman: The number of Syrian refugees arriving in Jordan is 1.5 million. This is equivalent to the volume of people arriving from Canada to the US, Prince Al Hassan Bin Talal noted at the conference ‘Exploring the water-peace nexus — Blue peace in West Asia’ held in Amman last week. Refugees now represent a quarter of the Jordanian population.

The refugee population has put considerable strain on local water resources, causing water scarcity problems in several areas. As of February 2015, there are a total of 17 million displaced people in five countries (Jordan, Iraq, Lebanon, Syria, and Turkey.)

“TIM is our challenge — territoriality, identity, and migration,” said Prince Bin Talal.

He pointed out the increase in demand for water after the 2014 Syrian crisis was due to ‘natural’ population growth. Emphasising the need to develop a sense of regional wellbeing, he said: “Let’s look at people as people and remove the labels for a moment — this is an existential battle we are engaged in today.”

Prince Bin Talal highlighted the need to listen to the view of local civil society groups on assessing water challenges they are facing, and providing them with solutions to build capacity.

“Everyone needs to be given a second chance, a second chance to build their environment, a second chance to a decent social income, a second chance to an equitable and efficient water policy.”

Also addressing the conference, Sa’ad Abu Hammour, Secretary-General of the Jordan Valley Authority, said that the influx of Syrian refugees had put immense pressure on Jordan’s water services. Latest numbers show that there are a total of 3.5 million internationally displaced people (IDP) in Jordan, of which half a million live in hydro-insecure governorates.

“The population of the Jordan Valley is relatively poor, and has recently grown with more refugees coming in from Syria and Iraq,” said Abu Hammour.

The growing number of refugees is not improving the existing political debate about water in the Jordan River Basin, which is considered a major issue in both the Arab-Israeli conflict and Israeli-Palestinian conflict.

“The joint water committee intended Palestine and Israel to be equal partners, but Israeli influence over the West Bank gave them control of the water systems,” said Maysoon Al Zoubi, former secretary-general of the Jordan Valley Authority.

She pointed out that reports show the joint water committee has fallen short of meeting the Palestinians’ needs. “Since 1991, projects are still awaiting approval from the committee, and Israel alone has the virtual veto on all water resources,” Maysoon said.

Currently, only 31 per cent of Palestinians are connected to the sewage system.

Similarly, Jordan and Syria set up a joint plan to utilise the water resources of the Yarmouk River in 1953 - an agreement that proved unsuccessful due to violations of the terms and poor construction of dams.

“We need a new body that will accord equal rights to both sides in all water resources,” said Maysoon. She added that the issue of water scarcity should be a priority for each country in the Middle East as water is linked to the economy, social life, and power. ‘The Hydro Insecure: Crisis of Survival in the Middle East’ report highlights that water insecurity does not occur alone, but is accompanied by one or more issues such as poverty, war and conflict, low women’s development and environmental degradation.

The misconception that the water problem is only a result of government mismanagement and not capacity can be altered through awareness and education, said Maysoon. “We need to work on a capacity-building programme that should include officials, decision makers and the people — along with international water laws.”

The two-day conference, which took place on March 18-19 in Amman at the King Hussain Club brought together political figures and experts on water from around the globe to discuss possible strategies and solutions given the increasingly desperate water situation in the Middle East.

The Strategic Foresight Group, one of the organisers of the event, launched two reports; ‘the Hydro-insecure: Crisis of Survival in the Middle East’ report, and another on ‘Water and violence: Crisis of survival in the Middle East.’ The West Asia-North Africa (WANA) Institute acted as partner organiser of the conference.

### **Water insecurity — the reality**

Iraq: 33% of Iraq’s population of 32 million is water insecure

Jordan: 27% of Jordan’s population of 6.4 million is water insecure

Lebanon: 13% of Lebanon’s population of 4 million is water insecure

Syria: 44% of Syria’s population of 22.3 million is water insecure

Turkey: 16% of Turkey’s population of 74.5 million is water insecure

*Source: ‘The Hydro Insecure: Crisis of Survival in the Middle East’ report*

“Refugees exacerbate water crisis in Middle East”, 22/03/2015, online at:

<http://gulffnews.com/news/mena/jordan/refugees-exacerbate-water-crisis-in-middle-east-1.1475639>

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## ❖ Palestinians accuse Israel of ‘unfair distribution’ on World Water Day

Water supply and sanitation in the Palestinian territories are suffering from the unfair distribution of resources on account of Israel, Palestinian authorities said, bringing attention to their struggle in a statement issued on World Water Day.

The Palestinian Water Authority (PWA) and the Palestinian Central Bureau of Statistics (PCBS) [called](#) for sustainable infrastructure development in the wake of Israeli occupation to ensure not only water availability but also its quality.

*“Palestine suffers from the unfair distribution of water sources, which remain under almost full Israeli control. As an evidence to this inequality, the Israeli daily share per capita of water consumption reached seven times higher than the Palestinian’s,”* PWA and PCBS said in a joint press statement.

Palestinian water resources are fully controlled by Israel, subject to the provisions enshrined in the Oslo Accords. In the West Bank, according to some estimates, Israel is using more than 85 percent of the water, covering around a quarter of its own needs.

In order to cover its needs in the Gaza Strip in 2013, Palestinians pump over 100 million cubic meters of water from the coastal aquifer, according to the statement, far exceeding its *“sustainable yield”* of some 50-60 mcm. Another 104 mcm were extracted in the West Bank.

In addition the water that remains suffers from poor quality.

*“More than 90% of the water pumped from the coastal aquifer in Gaza Strip does not satisfy the water quality standards of the World Health Organization,”* according to the statement.

As for the wastewater, the treatment plants do not have the capacity to handle all the waste, causing severe water pollution. The development of the sector highly depends on external financing, which is highly problematic because of the Israeli-imposed blockade. The lasting blockade of the Gaza Strip as well as the Gaza War last summer have caused severe damage to the water supply infrastructure in the Gaza Strip.

The water quality is considerably worse in the Gaza strip when compared to the West Bank, with only 5.8 percent of Gazans satisfied in 2013. In West Bank that number stood at 73.5 percent, the agencies said.



On the economic front, water shortages are having a “*negative effect*” on the Palestinian economy, especially on agriculture. It is estimated that roughly 90 percent of extracted water is used for field irrigation, about 20 percentage points higher than the international average. Yet this amount of water was only enough to irrigate 16 percent of Palestinian agricultural land.

Additionally, the Palestinian authorities said that Israel deprives them of their right to an estimated 250 mcm annual extract from the Jordan River since 1967. In general Palestinians claim they have a legal right to the ownership of three water sources in the area: The groundwater reservoir of the Mountain Aquifer, the Gaza Strip Coastal Aquifer and the Jordan River.

Prospects of sustainable water access to Palestinians are also being placed in jeopardy by the latest UN forecasts, which state that the world could suffer a 40 percent shortfall in water in just 15 years. Evidence on the ground seems to support this theory with some regions facing their worst droughts in decades.

The UN predicts that underground rainfall patterns will become more erratic with climate change and the underground water reserves will suffer as a result. And as the world’s population hits 9 billion by 2050, more groundwater will be needed to sustain such growth.

*“Unless the balance between demand and finite supplies is restored, the world will face an increasingly severe global water deficit,”* the annual World Water Development Report said.

The report predicts that global water demand will increase 55 per cent by 2050. Unless the trend is reversed, our planet will have only 60 per cent of the water it needs in 2030. As of today some 748 million people worldwide have limited or no access to clean drinking water.

“Palestinians accuse Israel of ‘unfair distribution’ on World Water Day”,23/03/2015, online at: <http://rt.com/news/243081-palestine-water-shortages-israel/>

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## ❖ Palestinian water in the Jordan Valley

The Jordan Valley marks Palestine's eastern border with neighbouring Jordan. It is home to approximately 60,000 Palestinians and its lands make up around 30% of the entire West Bank. It has a dry climate although it is home to some of the main natural water sources in all of historic Palestine. Following their displacement during the Nakba, many thousands of Palestinians moved to the area around Jericho in the knowledge that its abundant water supplies ensured the potential for regular work in the agricultural sector, yet today the effects of the Israeli occupation of the West Bank are at their most stark in the Jordan Valley. Amongst these wide reaching effects, Israel's control of Palestinian water highlights one more level of its colonial enterprise.

According to the the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), 87% percent of the Jordan Valley is officially classified as 'Area C' - the area that remains under full Israeli civil and military control. A further 7% is classified as nature reserves which also ensures Palestinian development is impossible. More than 9,000 Israeli settlers live in the Jordan Valley in 37 settlements.

Israel's economic benefit from its control of the Jordan Valley is huge. The Union of Agricultural Work Committees (UAWC) estimates that Israel's settlement agriculture in the Jordan Valley is worth \$850 million annually, whilst a further \$1 billion is reaped from the Dead Sea minerals and cosmetics industries. All of these industries rely on Israeli control of the areas water.

Save the Children estimate that the (9,000) settlers in the Jordan Valley have a combined daily water consumptions that is 6.6 times more water per day than the (60,000) Palestinians, whilst OCHA states that in the Valley's herding communities the consumption levels are as low as 20% of the World Health organisation's minimum standards.

Through regular house demolitions, the establishment of firing zones and nature reserves, laying of mine fields, movement restrictions and the colonisation of between 4-8 km's of land alongside the Jordanian border along with various other tools, Israel is working to empty the area of its Palestinian residents. According to standard form, Israel classes such practices as 'security needs'. Palestinians in

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the area simply want the right to life - fundamental to which is the basic human necessity of water access.

“Palestinian water in the Jordan Valley”, 22/03/2015, online at: <https://www.middleeastmonitor.com/news/middle-east/17650-palestinian-water-in-the-jordan-valley>

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❖ **Nature’s revenge’: Dead Sea surrounded by 3,000+ sinkholes growing at alarming rate**

Hundreds of sinkholes are forming each year around the drying Dead Sea that could face being completely parched by 2050. Its basin shrinks by a meter per year due to severe water mismanagement.

*“It’s nature’s revenge,”* Gidon Bromberg, the Israeli Director at EcoPeace Middle East, told ABC. EcoPeace unites environmental activists

*“These sinkholes are a direct result of the inappropriate mismanagement of water resources in the region,”* said Bromberg, who believes that the total number of sinkholes has grown to over 3,000. Just ten years ago roughly 1,000 sinkholes had been reported, according to Smithsonian magazine.

The Dead Sea, actually a lake, has existed in its present form, after splitting off from a larger water mass for the past 18,000 years. But since the 1950s Israel and Jordan have diverted the flow of the Jordan River, turning a once powerful flow into a trickle, full of sediment.

As a result, the Dead Sea is 800 million cubic meters short of water each year, and its level has fallen for 40 meters. As it recedes, it leaves behind salty deposits. While initially, these are firm, over the following years, the salt is dissolved, by rain, groundwater and river flows, creating a cavity underneath the ground.

These cavities can collapse any time, creating a deadly sinkholes. Several sinkholes can merge together, producing giant, gaping craters.

While no official statistics are kept about the deaths and injuries caused by them, there are hundreds of warning signs dotted around the edge of the water.

Last month Jordan and Israel signed a ground-breaking \$900 million deal that will see a desalination plant built on the edge of the sea, which will have water pumped into it via a canal from the Red Sea. Unfortunately, the costly project, approved by the World Bank is unlikely to significantly curb the deterioration, as it will only pump 100 million cubic meters of wastewater into the Dead Sea.

“Nature’s revenge’: Dead Sea surrounded by 3,000+ sinkholes growing at alarming rate”, 21/03/2015, online at: <http://rt.com/news/242929-dead-sea-sinkholes-israel/>

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## ❖ Unfair Distribution of Water in Palestine Due to Israeli Control

RAMALLAH, March 22, 2015 (Wafa) - Palestine continues to suffer from the unfair distribution of water sources in light of the almost full Israeli control, said Palestinian central bureau of statistics (PCBS) and the Palestinian Water Authority (PWA) said Sunday.

In evidence of water inequality, the Israeli daily share per capita of water consumption reached seven times higher than the Palestinian's, said the survey.

PCBS and PWA, in a [press release](#) issued on the occasion of the world water day March 22, 2015 presenting the key indicators related to water in Palestine, said the amount of water extracted from the coastal aquifer was 100.8 MCM in the Gaza Strip in 2013, but this quantity is obtained via unsafe pumping that jeopardizes sustainability of the source knowing that the basin sustainable yield should not exceed 50-60 MCM a year.

“More than 90% of the water pumped from the coastal aquifer in Gaza Strip does not satisfy the water quality standards of the World Health Organization.”

In terms of sanitation, the Israeli occupation obstructs any Palestinian construction of wastewater treatment plant, denying them thus the right to benefiting from the treated water.

Results from the survey showed that, in 2011, about 6.2% of households had no access to improved drinking water, but this percent dropped to 2.5% in 2013. It said that the percentage of households with access to improved sanitation was 63.6% in 2013 compared with 51.4% in 2008.

“It should be noted that the Palestinians have been denied access to extraction from the Jordan River since 1967, which deprives them of their rights to this water whose quantity was estimated at 250 MCM,” said the report.

According to United Nations data, 90% of the extracted water is used for irrigation; however agriculture consumes 70% of the available water around the world.

“The quantity of water available for agriculture in Palestine is insufficient to serve the planted areas (1,034,901 dunum) in 2010/2011, of which 167,671 dunuma of is irrigated areas,” it said.

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Regarding water quality, 48.8 % of Palestinian households considered water quality to be good in 2013.

“Unfair Distribution of Water in Palestine Due to Israeli Control”, 22/03/2015, online at:  
<http://english.wafa.ps/index.php?action=detail&id=28117>

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## ❖ Water Scarcity Looms Over Land Of 10,000 Lakes

Could the land of 10,000 lakes be running out of water?

In a [recent report](#), 5 EYEWITNESS NEWS examined just how serious Minnesota's water problem is, and the results were not reassuring for residents of the state. Minnesota is struggling against various factors that have made its water increasingly hard to come by.

One problem is the shifting population density in many towns. The town of Hugo, situated near St. Paul, is one example.

"[Back] in 1969, 750 people lived in Hugo. Today, 14,000 call it home. Hay bales huddle in the shadows of housing developments. Each one brings more glasses to fill and lawns to water," the report said.

"Hugo has five municipal wells. All of them draw water from the Prairie du Chien-Jordan aquifer—the same one linked to lower water levels on White Bear Lake, which plunged about four feet from 2005 to 2011," the report said.

The problem extends beyond White Bear Lake. Pine Tree Lake, Mann Lake, Round Lake, Sunset Lake, and Oneka Lake have all dropped at least two feet over the same time span.

"Most of those lake levels have at least partially recovered. But they show that the Twin Cities may be treading water," the report said.

Public policy is also a factor exacerbating Minnesota's water challenges, according to Deb Swackhamer, a professor and water expert at the University of Minnesota. She said Minnesota cannot sustain itself under its current policies.

Here's how water management has changed in Minnesota over the years: "Decades ago, most of that tap water came from lakes, rivers, and streams—the surface water Minnesotans know and love. In the 1950s, about 80 percent of the Twin Cities' drinking water came from such surface water resources.



Today, more than 70 percent comes from groundwater, buried deep underground in aquifers. That is a dramatic, and hugely important, reversal," the report said.

Another challenging factor is a general lack of awareness around water supply problems. "Our groundwater is completely invisible, so we don't think about that at all. We just turn on our tap and go, 'Oh great. We have great water here,'" Swackhamer said, per the report.

Still another challenge Minnesota faces is a lack of sufficient rainfall. According to [the U.S. Drought Monitor](#), nearly all of the state is experiencing abnormally dry weather.

"Many regions in the state have reached the point where people are using water — and then sending it downstream — faster than the rain and snow can replenish it," the *Star Tribune* [reported](#).

"Water Scarcity Looms Over Land Of 10,000 Lakes", 18/03/2015, online at: <http://www.wateronline.com/doc/water-scarcity-looms-over-land-of-lakes-0001>

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### ❖ Egypt ‘highly sensitive’ toward any Nile dam Project

Egypt is “highly sensitive” toward any project to store the Nile’s water in upstream countries as it might reduce the country’s water supply, Egyptian irrigation minister Hossam Moghazi said in remarks carried by state news agency MENA Tuesday.

During his meeting with a Sudanese media delegation, Moghazi described Egypt’s current share of Nile water as already not enough to cover the country's needs.

With Egypt’s population expected to reach 150 million in 2050, the country will likely need an additional 21 billion cubic meters of water per year to meet its projected demands, Egypt's National Planning Institute has said.

Egypt is currently dealing with Ethiopia, which is building a large dam on the Blue Nile - the Nile’s largest tributary - to include a 74-billion-cubic-metre reservoir when finished.

Addis Ababa claims the dam would not harm downstream countries Egypt and Sudan.

Egypt, Sudan and Ethiopia all agreed to select a consulting firm to conduct an impact study on the dam’s construction but so far no company has been shortlisted.

At the opening ceremony of the economic conference in the resort Red Sea city of Sharm al-Sheikh on Friday, Ethiopia’s Prime Minister Hailemariam Desalegn said: “The Nile constitutes a common destiny: we either sink or swim together ... We chose to swim together.”

“Egypt ‘highly sensitive’ toward any Nile dam Project”, 18/03/2015, online at:

<http://english.alarabiya.net/en/News/middle-east/2015/03/18/Egypt-highly-sensitive-toward-any-Nile-dam-project.html>

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### ❖ Egypt says Nile water rights 'unchanged'

Egypt stressed today that it has made no concessions on its share of the Nile's water.

The announcement came days before President Abdel Fatah Al-Sisi is expected to sign an agreement regarding Ethiopia's controversial mega-dam on the Nile River.

"Egypt's rights stated in all Nile water treaties have not been tampered with," the Egyptian Foreign Ministry said in a statement, referring to three major Nile water treaties signed in 1902, 1929 and 1959 respectively.

The assertion comes ahead of a three-day tour by Al-Sisi to Ethiopia and Sudan which will begin on Monday.

Sudanese Foreign Minister Ali Karti recently said that the leaders of Egypt, Sudan and Ethiopia will sign an agreement regarding Ethiopia's multi-billion dollar dam project, which Egypt fears will reduce its share of the Nile water.

However, an Egyptian presidential source had told the Anadolu Agency that the deal's signing during Al-Sisi's visit was not yet confirmed.

Ethiopia's Grand Renaissance Dam has been at the centre of a diplomatic row between Cairo and Addis Ababa for several months.

While Ethiopia views the multi-billion dollar dam as a prerequisite for economic development, Egypt fears the project will lead to a marked reduction in Egypt's supply of Nile water.

A committee including ministers from Egypt, Ethiopia and Sudan has convened several times in Sudan and Ethiopia to discuss the dam's potential impact on downstream states.

"Egypt says Nile water rights 'unchanged'", 20/03/2015, online at:

<https://www.middleeastmonitor.com/news/africa/17630-egypt-says-nile-water-rights-unchanged>

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## ❖ Ethiopia Eyes Middle East Market for Agricultural Products

Ethiopia targets countries in the Middle East for its agricultural products and live animals export, the Ministry of Trade announced.

Saudi Arabia and United Arab Emirates (UAE) are the countries the government eyes for its export destinations, Yeshak Tekaligne, Director of Bilateral and Regional Trade Relation and Negotiation told ENA.

These countries are the largest destinations for Ethiopia's agricultural products, with Saudi Arabia and UAE receiving 35 and 17 per cent of the country's exports destined in the region respectively.

Live animals, coffee and sesame are among the major export items of Ethiopia to the region. Ethiopia has exported agricultural products worth 1.15 billion USD to Saudi Arabia and UAE alone during the past four years.

Most of the countries in the region are highly dependent on imported agricultural products for food, mainly because of effect on the limited water resource and the cost of desalination.

Countries like Saudi Arabia are planning to stop growing wheat locally and entirely rely on imports beginning from 2016, because of the pressure on water resources and a shift towards overseas food investment. Saudi Arabia imported 3 million tons food in 2014, which makes it the sixth largest wheat importer that same year.

The shift will benefit Africa in general and Ethiopia in particular because of its potential and geographical proximity.

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According to Yeshak, the government understands the high demand for food items in the region and working to increase export volume and items.

Besides its geographical proximity to the Middle East, Ethiopia's high soil fertility and abundant water resources position the country among potential suppliers of food items and investment destination for Middle East companies.

“Ethiopia Eyes Middle East Market for Agricultural Products”, 19/03/2015, online at:

<http://allafrica.com/stories/201503191512.html>

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## ❖ Water security needs GCC water cooperation

On March 22 each year, the world celebrates World Water Day (WWD). It attempts to remind people about the significance of fresh water and the need to promote sustainability for fresh water resources management. Many events, media campaigns, contests, excursions to local rivers and lakes are held worldwide to celebrate the day. WWD 2015 is very significant for the world and the UAE in particular because:

- The theme of the day 2015 is “water and sustainable development”. Water plays a key role in sustainable development. Development plans depend upon water resources in terms of quality and quantity. Beyond meeting basic human needs, water supply and sanitation services as well as water as a resource are critical to maintain a healthy environment and guarantee achieving sustainable development.
- 2015 marks the end of UN Water for Life Decade (2005-2015). Water decade encourages water cooperation, especially in regions that share the same problems and resources.
- The limited availability of fresh water in UAE and the Gulf region in general has for decades presented a major challenge to the people and the governments of the region. Scarce rainfall together with a high rate of evaporation and consumption, leads to deficits in the water budgets.
- In order for the UAE to keep up its fast growing development in all aspects of life, it must take all necessary measures and policies to guarantee the availability of water resources for various uses. Otherwise, the country is very likely to face many potential problems on the security, economic and social fronts related to the availability of water.

Thus in a water-thirsty region like GCC, water cooperation is a must to help achieve water security for the people, for development process and for environmental requirements.

According to the UN-Water 2013, water security is defined as “the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability”.

Water security addresses the issue of environmental protection and seeks good governance for water resources. It also aims to end the fragmented responsibility for water between various authorities, municipalities, countries, regions...etc. and integrating water policies across all sectors – finance, planning, agriculture, energy, tourism, industry, education and health.

Water is a cross-sectoral issue and understanding of the multiple functions that water plays in society is fundamental for any country to plan, allocate and manage water resources in a sustainable manner.

First and foremost, the strategy for sustainable use of water resources is to protect and conserve the available resources. This calls for harvesting every drop of water through rainwater harvesting, protecting the natural and manmade storage reservoirs as well as groundwater aquifers. Besides developing new systems and technologies, protecting the traditional systems such as the Aflaj is also imperative. A competent strategy to tackle water security from both the supply and demand side is necessary for ensuring that development is sustainable in the Gulf region.

GCC countries face the same environmental challenges especially in water sector. GCC shares underground aquifers so the states must work together to better utilise these aquifers in a sustainable way.

There is plenty of room for cooperation in GCC on many aspects related to the water sector such as monitoring and utilisation of ground water tables, recycling, water desalination, joint water research and projects, the use of renewable energies in water desalination, etc.

GCC states need to work to provide sufficient water for their people as we have seen that water issues have caused a lot of unrest in many countries especially in the Middle East in the last few years.

Better GCC water cooperation could be the key to mitigating the risk of further conflict and achieve water security for the region. Water security is a real incentive for GCC-wide cooperation in water-related projects.

Thus, the issue of water security should be on the top of UAE and GCC political policy agenda. There is no doubt that water cooperation is a step in the right direction and also opens the gates to peace and prosperity in the region. The WWD is the right occasion to get started.

“Water security needs GCC water cooperation”,23/03/2015, online at: <http://gulfnews.com/opinion/thinkers/water-security-needs-gcc-water-cooperation-1.1475858>

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## ❖ Yemen's Persistent Humanitarian Crisis

### Summary

Yemen is in a state of flux. The al-Houthi rebels retain control of the capital, President Abd Rabboh Mansour Hadi has retreated to the southern city of Aden, and the exact future of the nation is uncertain. There are growing indications that Saudi Arabia and its neighbors are trying to negotiate a more formal split in Yemen, as Riyadh struggles to maintain stability in the country. Apart from the political split and the details of the conflict, the general population faces a difficult road ahead, and the humanitarian crisis will only be exacerbated by a worsening water scarcity crisis; a faltering economy overly reliant on foreign aid, food imports and declining energy revenue; and an unstable security situation.

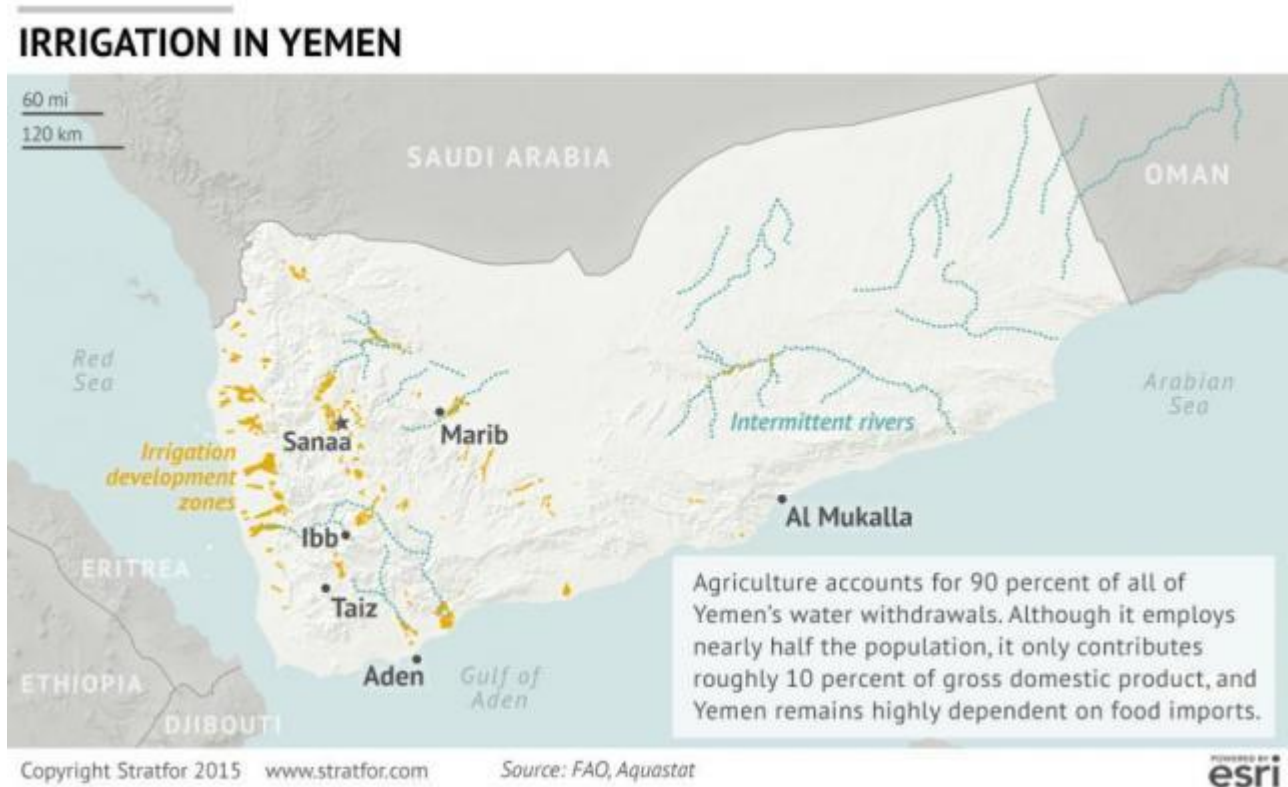
Assuming the country eventually splits into two separate nations, North Yemen will certainly face the brunt of the economic and security crises. Most foreign aid will follow Hadi to the south in a split, giving Iran the opportunity to increase its influence in the north. However, even after reportedly giving the al-Houthis an economic aid package in recent days, Iran will not have the means to handle the growing humanitarian crisis in the region, and Saudi Arabia will be unable to choose sides. Riyadh will be forced to take the lead in stemming the humanitarian crisis on the northern side of the new border while it supports the new government in the south.

### Analysis

Unrest is nothing new for Yemen. The country's rugged and mountainous geography led to the development of numerous tribes that constantly compete for limited resources. Modern Yemen has been unified only since 1990, and it seems unlikely that it will stay that way for much longer. Before the al-Houthi rebels took control of Sanaa, a federated state split into six different regions was proposed, but recent developments suggest that a split into two separate nations is more likely. Even then, the unrest in Yemen will continue, and we expect to see the humanitarian crisis worsen as a result, especially in the north.

## Growing Water Scarcity

[Yemen's water problems](#) are well documented. Its climate and rapidly growing population, along with a lack of regulation, have resulted in extreme overuse of existing resources, especially groundwater. Subsidized diesel has made pumping water more affordable and thus has led to rampant over-pumping of groundwater resources. This, along with the cultivation of the water-intensive and addictive qat, an herbal stimulant, has brought the country to the brink of disaster. The capital, Sanaa, will run out of a useable water supply somewhere between 2017 and 2025, according to estimates.



The cash-strapped government does not have access to the amount of money necessary to address the problem. Nor does the water crisis have priority in government spending; the budget for the National Water Resource Authority was cut 70 percent recently. Moreover, there is currently no enforcement of existing water-use regulations.

## Energy Revenue and Economic Decline

Prior to the 1980s, Yemen depended on remittances from workers abroad to sustain the economy. After the discovery and exploitation of oil reserves, Yemen's economy became extremely reliant on the hydrocarbon sector (which provided 25 percent of gross domestic product and 63 percent of government revenue), but production peaked at roughly 440,000 barrels per day in 2001 and declined to around 133,000 barrels per day by 2013. Coupled with the recent fall in oil prices, the drop in production has significantly reduced revenue derived from energy exports. In 2008, Yemen exported some \$5.9 billion worth of crude oil, and by 2013, before the precipitous drop in oil prices, crude oil exports had fallen to \$3.25 billion. A report issued by the Central Bank of Yemen showed that revenues from oil exports fell by almost a billion dollars in 2014, indicating that exports had plummeted even further. Without significant investment to recover or even maintain production, these numbers will continue to fall.

Although liquefied natural gas exports could provide another source of revenue, security issues will threaten the viability of the pipeline for exports. Moreover, even the potential \$300 million a year that could be generated by LNG exports is not enough to make up for the diminished oil revenue. Domestically, severe problems with the electricity grid and generation capacity are worsened by the frequent sabotage of power lines. A large food import bill — Yemen depends on imports for 90 percent of basic foodstuffs — further compounds the economic turmoil.

Yemen's foreign currency reserves are also declining; they slipped to \$4.6 billion in November 2014 from \$5.1 billion in September 2014 in part because of the need to import petroleum products. This amount is enough to import food and fuel for only a few months. The reduction in aid after the al-Houthi takeover of Sanaa has compounded the shortage and has left Yemen in a precarious economic situation. Anecdotes indicate citizens are removing money from banks, making the collapse of the riyal a real possibility — a development that would leave the already struggling government unable to pay salaries.

## The Role of Foreign Aid

Yemen relies greatly on foreign aid, requiring upward of \$1.6 billion per year to just avoid a balance of payments crisis. In 2012, net official development assistance disbursed to Yemen from its top 15 donors (excluding contributions from Saudi Arabia) was roughly \$445 million. Germany, the United States and the United Kingdom are the largest Western backers, while the United Arab Emirates is the largest regional backer, according to the Organization for Economic Cooperation and Development's records. That said, Saudi Arabia is hands down the largest backer overall, providing roughly \$1 billion to 2 billion per year to its southern neighbor, in part as an effort to keep the security situation there from spilling over its own southern border. Patronage to specific tribes allows the Saudis to exert influence on the Yemeni government.

Should Yemen adopt a two-nation arrangement, Saudi Arabia, Iran and other regional powers will likely continue with the [patronage strategy](#). Iran will focus its support on the al-Houthis in the north. The Gulf Cooperation Council states and Saudi Arabia will support a Hadi-led southern government, but Saudi tribal patronage will necessarily span both North and South Yemen if Riyadh hopes to maintain a security buffer.

## Displaced Individuals

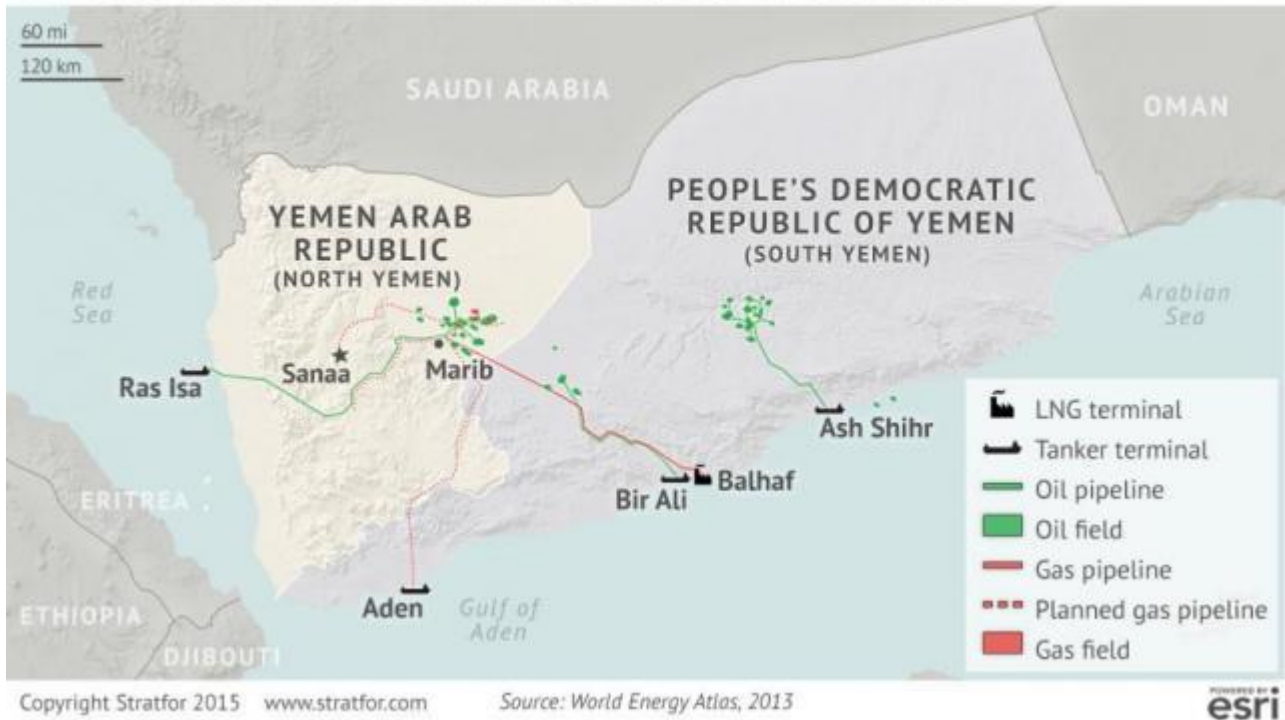
The security situation in Yemen has contributed to the number of displaced people in the country. Approximately 335,000 internally displaced people and 245,000 refugees live within Yemen's borders from years of conflict inside Yemen and across the sea in the Horn of Africa. The northern part of the country has borne the brunt of these migrations; more than 100,000 internally displaced people are located in Saada province and more than 81,000 are in Hajja province.

Many of the displaced people from southern Yemen have returned home since the end of the 2011 unrest. However, in the northern part of the country, where people have been displaced since the 2009-2010 conflict, displaced people have not yet returned home. The country will struggle to support the nearly 450,000 Yemenis who have returned through various entry points since January 2013.

## The Future of Yemen

All of these crises are likely to remain the same or worsen, especially in northern Yemen. Assuming that the country splits in two along a north-south divide, which appears to be what Riyadh and others are supporting, the division of oil revenues would be important initially. However, those revenues will continue to decline rapidly, and outside investment will be unlikely given the poor security situation over the next five to 10 years. LNG revenues are comparatively low and are not likely to rise significantly. The distribution of international aid will be key to the relative success of each of the two new Yemens.

### YEMEN'S HISTORICAL DIVIDE AND ENERGY RESOURCES



Even after the split, a strong, central government is not likely to emerge in the north. Even though [the Zaidis](#) ruled what was once North Yemen for centuries, the al-Houthis do not necessarily want to govern the entirety of what would be North Yemen. Moreover, there could still be unrest in Marib and resistance from the al-Amar tribal faction and the Hashid federation, although at this point the al-Houthis have dampened most resistance in their traditional territory. Without a strong central government willing to begin infrastructure projects and enforce water regulations (and end diesel

subsidies), the water crisis will come to a head in the next five years. Without access to the country's desalination capacity (which likely will fall to South Yemen), urban populations will continue to lose what few water resources they have over the next five to 10 years, and an increase in displaced people will be likely.

Even if the conflict is settled by a split into two states, Yemen — already reliant on international aid simply to function — will require even more support. International humanitarian aid organizations can operate in hostile environments (such as Somalia and Syria) and help individuals there, but Yemen's needs are already underfunded. As the need for humanitarian aid grows, less and less of that need is likely to be met. More individuals will become displaced because of the water crisis, and the growing poverty will exacerbate the security situation as competition increases for limited resources. The Saudis are likely to make more investments in border security (in addition to their current multi-billion-dollar efforts) as Yemenis seek refuge across the border. Riyadh will also likely give some sort of financial support to North Yemen, even if it sides with South Yemen, since it will be in the Saudis' interest to secure that border and to minimize Iran's increasing influence as best they can.

“Yemen's Persistent Humanitarian Crisis”, 16/03/2015, online at: <https://www.stratfor.com/analysis/yemens-persistent-humanitarian-crisis>

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❖ **Marriott reduces water intensity by 5.3% in 2014**

**Marriott International reduced water intensity by 5.3% in 2014 over 2013, and by 16% since 2007 at its managed hotels globally.**

The water conservation results were revealed on the eve of today's World Water Day (March 22).

Denise Naguib, vice president, sustainability and supplier diversity, Marriott International commented: "We are extremely pleased with our 2014 water intensity results.

"Water conservation is an area of sustainability where hotels, associates, and guests can directly aid the environment by reducing their water usage, whether it is through the fitting of low flow showers and toilets in guest bathrooms, irrigation systems installed on properties, or guests choosing to not have towels changed every day."

The company set a target in 2007 to reduce its water consumption by 20% by 2020 and to make energy reductions of 20% across its global portfolio as part of a wider sustainability strategy.

Ten hotels across the Middle East and Africa region implemented water conservation projects in 2014.

These projects, including water saving bathroom fixtures and smart irrigation sensors, to help to save approximately 92,000 m<sup>3</sup> of water annually.

The Ritz-Carlton Doha, installed a smart control system for landscaping, and the Renaissance Sharm El Sheikh Golden View Beach Resort has installed water aerators for guest rooms.

In Asia Pacific, the Nobility of Nature project in Sichuan Province, China, aims to protect the sources of fresh water for more than two billion people.

The project also encourages water conservation in Marriott hotels. Participating China and Hong Kong properties reported a 7.94% reduction in water intensity in 2014.

In North America, more than 80% of the total participating hotels in the Environmental Protection Agency WaterSense H2otel Challenge are in the Marriott portfolio.

The Ritz-Carlton Battery Park was the 2014 winner of the NYC Water Conservation Challenge with a more than 10% water reduction.

In Europe, where Marriott plans to triple its portfolio by 2020, Marriott managed hotels saved 20.3 million gallons of water in 2014 through a number of initiatives ranging from pump audits to high efficiency dishwashers and water efficient shower heads.

“Marriott reduces water intensity by 5.3% in 2014”,22/03/2015, online at: <http://www.hoteliermiddleeast.com/23291-marriott-reduces-water-intensity-by-53-in-2014/>

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### ❖ One wall, many jobs

*Dams are fascinating. For the functions they perform, their architecture and the technical detail that goes into its construction.*

India has a total of 4,710 dams ranking it fourth after China, US and Russia. Massive barriers built across rivers and streams, dams were built as early as in 3000 BC.

The Kallanai dam constructed of unhewn stone, across the Cauvery in Tamil Nadu, is the oldest and still-in-use reservoir in India.

Dams are important because they ensure people have water for personal use as well as for industry and irrigation. They provide hydropower. Dams are also being used for fishing and recreation. But its significant purpose lies in reducing or preventing floods.

Mesopotamia and the Middle East have recorded the earliest instances of dam building. These dams were used to control the water level because the Tigris and Euphrates were unpredictable.

The Jawa Dam in Jordan is dated back to 3000 B.C. In the 9th century, the Pharaohs Amenemhat III and Amenmehat IV dug a canal 16 km long linking the Fayum Depression to the Nile in Middle Egypt. Two dams called Ha-Uar running east-west were built to retain water during the annual flood and then released to surrounding lands.

One of the engineering wonders of the ancient world was the Great Dam of Marib in Yemen. Initiated somewhere between 1750 and 1700 BC, it was made of packed earth, running between two groups of rocks on either side, to which it was linked by substantial stonework.

Since 1947, India has built many dams and reservoirs. These dams are a major tourist attraction. While the Tehri dam is the eighth highest dam in the world, the Idukki dam is the first Indian arch dam built across River Periyar in Kerala and is the largest dam in Asia. Indira Sagar Dam has the largest reservoir in India.

In India, most of the dams are maintained by the State Governments with just a few exceptions like the Bhakra Beas Management Board, Damodar Valley Corporation and National Hydro Electric Power Corporation (NHPC) who own and operate their dams.

Dams also have a downside. Such big water reservoirs have an impact on rivers, the environment, forest and wildlife around the area and the local people. Though they are useful for some species like cold water fish, they also adversely impact forests, wetlands and wildlife and plants and animals. The dam wall blocks fish migration.

Changes in temperature, chemical composition, dissolved oxygen levels and the physical properties of a reservoir are often not suitable for the aquatic plants and animals that evolved with a given river system.

“One wall, many jobs”, 19/03/2015, online at: <http://www.thehindu.com/features/kids/dams-one-wall-many-jobs/article7011120.ece>

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## ❖ Permaculture Creates an Oasis in the Middle East

The Middle East is one of the most architecturally and archaeologically rich pieces of real estate on the planet. The region is wealthy with oil and gold and yet there is also immense poverty. Although it contains “The Fertile Crescent” – the very cradle of modern agriculture – it is a dry, harsh and unforgiving landscape. It truly takes a skilled and inspired worker, willing to educate the citizens of the desert in permaculture, to grow anything at all in the harsh soil.

One man has succeeded, even with inadequate funding and amid political turmoil, in making the desert bloom. His name is Geoff Lawton, and he has worked all over the planet, teaching people how to work with nature to provide an abundance of food in even the most inhospitable of climates through the use of a method of agriculture called permaculture. Permaculture is a subset of ecological engineering and design, environmental construction and design and integrated water resources management which creates a self-maintained and regenerative habitat and agricultural system modeled after natural ecosystems.

Lawton’s “Queen of the Desert Project” took place among the people of the Jordan Valley, which is located two kilometers from the Dead Sea. Although the project has been revolutionary, it has not involved guns, rockets or IEDs. Lawton and his team took an almost completely flat, barren, and heavily-salted piece of ground and within three years, turned it into a lush, food-producing paradise.

In the first year, there were fig trees 3-feet-tall and bearing fruit as well as mushrooms, pomegranates, date palms and citrus; all grown using a fifth of the water that surrounding conventional farms were using. His work drew the interest of agricultural scientists at Jordan University, who tested the soils and found that the salt levels in the earth were actually decreasing. The scientists were concerned that the salt was being washed into the aquifer instead, but a double-check of the water meter confirmed that insufficient water had been used to allow this to happen. What was happening was that the salts were being locked into the organic soil matrix in an insoluble, colloidal form that was unavailable to plants.

Even years after the project was wrapped up due to a lack of funding, the earthworks that were the secret to its success (known as swales) were intact and still functioning. Despite a degree of

mismanagement, the system was still operating adequately enough to provide a constant supply of food and livestock fodder to the local community.

Lawton and Permaculture Australia have since teamed up with Muslim Aid Australia to establish a new “Greening the Desert” research farm near the city of Jericho. The new project has matured to the point where it now provides food for humans and animals. More importantly, however, it is training people in permaculture methods. The group is traveling throughout the Middle East and all over the world, showing people who have nothing how they can set up a permanent farming system that will provide for all of their physical needs.

“Permaculture Creates an Oasis in the Middle East”,20/03/2015, online at: <http://guardianlv.com/2015/03/permaculture-creates-an-oasis-in-the-middle-east/>

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❖ **Global population growth threatens to outstrip fresh water supply: study**

ROME (Thomson Reuters Foundation) - Global demand for fresh water is set to outstrip supply as a result of population growth by the middle of this century if current levels of consumption continue, a study said.

Fears of water shortages could intensify although this is not the first time in history that demand is poised to outpace supply, Tony Parolari, the study's lead author, said on Wednesday.

"Global water consumption per capita has been declining since 1980 which means efficiency is increasing," Parolari, a researcher at Duke University, told the Thomson Reuters Foundation.

"But if population growth trends continue, water use will have to decline more substantially."

The world's population is expected to hit 9.6 billion by 2050 from more than 7 billion now, according to U.N. estimates.

Whether humans can adapt to declining water supplies depends on what new technologies for finding water are developed, and whether population growth levels off, the study said.

The paper, published in the journal WIREs Water, analyzed historical information on water consumption and demographics with the help of mathematical models to chart changes over time.

Shortages are already affecting millions in Sao Paulo, [Brazil](#), where residents have been hoarding water in their apartments following a drought, and the U.S. state of California which is entering its fourth year of drought.

In past eras of water scarcity, during the expansion of European cities such as London and Paris in the 19th and early 20th century, technological solutions to the problem were developed - such as expanding pipeline networks to pump in water from further afield.

Current pressures could be solved or at least mitigated with new expertise, including improved ways of removing salt from ocean water to produce fresh drinking water, Parolari said.

“Global population growth threatens to outstrip fresh water supply: study”, 18/03/2015, online at:

[http://www.reuters.com/article/2015/03/18/us-global-water-consumption-idUSKBNOME2B720150318?utm\\_source=Circle+of+Blue+WaterNews+%26+Alerts&utm\\_campaign=9ed9970c20-RSS\\_EMAIL\\_CAMPAIGN&utm\\_medium=email&utm\\_term=0\\_c1265b6ed7-9ed9970c20-250657169](http://www.reuters.com/article/2015/03/18/us-global-water-consumption-idUSKBNOME2B720150318?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=9ed9970c20-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-9ed9970c20-250657169)

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❖ **Lab test results: Nearly 75% drinking water sources unsafe in country**

*ISLAMABAD: Almost 75% of the drinking water sources in all the four provinces of the country are contaminated and unsafe for human use, laboratory tests carried out by Pakistan Council of Research in Water Resources (PCRWR) have shown.*

The research body's water quality monitoring was initiated in 24 major cities across the four provinces. The objective of the programme was to identify the gaps and disseminate findings to the implementing agencies with recommendations for water quality improvement in the country.

The analytical data revealed that out of 360 total sources, only 90 sources (25%) have been found safe whereas 270 sources (75%) were found contaminated and unsafe for human consumption. The analysis of the water samples showed excessive levels of bacteriological contamination, hardness, arsenic, iron and total dissolved solids (TDS).

Some appalling statistics came out of Sindh where 96% of the water samples were found unsafe. Out of the four cities, samples in Badin were found safe. But not a single sample in Karachi, Hyderabad and Sukkur was safe or fit for human consumption. In Punjab, 63% samples were unsafe, Khyber-Pakhtunkhwa (K-P) 90% and in Balochistan 85% water samples found unsafe for drinking purposes.

The research council selected 163 samples in 12 cities across Punjab for water analysis and out of that only 60 samples were found safe while 103 were found unsafe. These cities include Bahawalpur, Faisalabad, Gujranwala, Gujrat, Kasur, Lahore, Multan, Rawalpindi, Sargodha, Sheikhupura and Sialkot.

In Sindh, four cities were selected including Hyderabad, Karachi, Sukkur and Badin and 85 water samples were tested from different sources and only three samples were found safe and 82 samples or 96% were found unsafe for human use.

In K-P, the PCRWR had selected four cities – Abbottabad, Mingora, Mardan and Peshawar – and found that out of a total of 40 only four samples were found safe while the remaining 36 were found unsafe.

In Balochistan, four cities – Khuzdar, Loralai, Quetta and Ziarat – were selected for water testing and 47 sources were tested. Only seven samples were found safe for drinking while 40 samples or 85% of the were found contaminated.

Talking to *The Express Tribune* Dr Lubna Naheed Bokhari, spokesperson for PCRWR, said the analysis and laboratory tests of water sources proved that drinking water in most of the cities is unsafe for human consumption. “Our analyses have found different kind of contaminations in the drinking water and without treatment its usage is unsafe for health,” she stated.

Environmentalist Asif Shuja Khan said a majority of population is forced to use raw water. “It is necessary that every water source should be given to the citizen after complete treatment process,” he said.

There should be master plans for every city for water treatment and its safe supply to every locality, he added.

He pointed out that in Pakistan waterborne diseases account for almost 40% of the diseases that people suffer. This can be overcome by providing safe drinking water to the citizens.

“Lab test results: Nearly 75% drinking water sources unsafe in country”, 14/03/2015, online at: [http://tribune.com.pk/story/852938/lab-test-results-nearly-75-drinking-water-sources-unsafe-in-country/?utm\\_source=Circle+of+Blue+WaterNews+%26+Alerts&utm\\_campaign=cab01318e9-RSS\\_EMAIL\\_CAMPAIGN&utm\\_medium=email&utm\\_term=0\\_c1265b6ed7-cab01318e9-250657169](http://tribune.com.pk/story/852938/lab-test-results-nearly-75-drinking-water-sources-unsafe-in-country/?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=cab01318e9-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-cab01318e9-250657169)

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## ❖ Coca-Cola, East African Breweries Back Kenya Water Supply Fund

(Bloomberg) -- Kenya is starting a fund to provide water supply to more than 9.3 million people in East Africa's largest economy, organizations involved in the venture said on Friday.

The so-called Nairobi Water Fund, backed by government agencies, businesses, conservation groups and utility companies, is a public-private partnership and will generate \$21.5 million in long-term benefits, the organization said in an e-mailed statement, without providing details

“This landmark initiative will cut costs for hydro-power and clean water, while addressing water flow and soil erosion issues in the Upper Tana River basin,” the fund said in the statement.

Backers include East African Breweries Ltd., Coca-Cola Co., Kenya Electricity Generating Co., The Nature Conservancy, the Nairobi City Water and Sewerage Co., the International Center for Tropical Agriculture, Frigoken Horticulture and Pentair Plc, a water technology company.

“Coca-Cola, East African Breweries Back Kenya Water Supply Fund”, 20/03/2015, online at: [http://www.bloomberg.com/news/articles/2015-03-20/coca-cola-east-african-breweries-back-kenya-water-supply-fund?utm\\_source=Circle+of+Blue+WaterNews+%26+Alerts&utm\\_campaign=1ba22e31af-RSS\\_EMAIL\\_CAMPAIGN&utm\\_medium=email&utm\\_term=0\\_c1265b6ed7-1ba22e31af-250657169](http://www.bloomberg.com/news/articles/2015-03-20/coca-cola-east-african-breweries-back-kenya-water-supply-fund?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=1ba22e31af-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-1ba22e31af-250657169)

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## ❖ Ahead of World Water Day, UN Calls for Better Management of Water Resources

**Nairobi/New Delhi/Paris, 20 March 2015** - The planet is facing a 40 per cent shortfall in water supply by 2030, unless we dramatically improve the management of this precious resource. This is the unavoidable conclusion reached in the 2015 United Nations World Water Development Report, "Water for a Sustainable World" launched today in time for World Water Day which will be celebrated on 22 March 2015.

The report, published by the World Water Assessment Programme on behalf of UN-Water stresses the urgent need to change the way we use and manage this vital resource, as the United Nations prepares to adopt new Sustainable Development Goals.

Achim Steiner, UN Under-Secretary-General and Executive Director of the UN Environment Programme (UNEP) said, "The impacts of our increasingly stressed global water resources can be felt by almost everyone, in the form of food insecurity, disease, degraded ecosystems, biodiversity loss, loss of economic productivity, endangered marine life, loss of tourism and more".

"What this means is that the remedy to these ills cannot be administered in a piecemeal and fragmented form. An integrated approach is key because solutions that address the environmental challenges, if they are to be effective, must also address the economic and social ones. All countries, regions and international agencies should combine efforts to apply integrated approaches to water supply chain management to address these challenges, now, and in the post-2015 development agenda", he added

"Water resources are a key element in policies to combat poverty, but are sometimes themselves threatened by development. Water directly influences our future, so we need to change the way we assess, manage and use this resource in the face of ever-rising demand and the over exploitation of our groundwater reserves. This is the appeal made by the latest edition of the UN World Water Development Report. The report's observations are timely, because the international community has to draw up a new development programme, to take over from the Millennium Development Goals", said UNESCO Director-General, Irina Bokova.

"There is already international consensus that water and sanitation are essential to the achievement of many sustainable development goals. They are inextricably linked to climate change, agriculture, food security, health, energy, equality, gender and education. Now, we must look forward to measurability, monitoring and implementation", said Michel Jarraud, Chair of UN-Water and Secretary-General of the World Meteorological Organisation

### **Growing demand**

In 2000 India had nearly 19 million mechanised or tube wells, compared to less than a million in 1960. This technological revolution has played an important role in the country's efforts to combat poverty, but the ensuing development of irrigation has, in turn, resulted in significant water stress in some regions of the country, such as Maharashtra and Rajasthan.

This example alone illustrates the complex relationships between access to water and development. While water is essential for economic growth and the fight against poverty, it is also itself directly affected by economic development. To find a solution to this conundrum, we must seek a balance between water supply and demand. But we are nowhere near this. Despite the considerable progress that has been made in recent years, 748 million people are still without access to an improved drinking water source. And those first affected are the poor, the disadvantaged and women.

At the same time, the planet has never been so thirsty. To answer the needs of an ever- growing population, the agriculture and energy sectors have to keep producing more and more. From now until 2050, agriculture, which consumes most water, has to produce 60 per cent more food globally, 100 per cent in developing countries. Demand for manufactured goods is also increasing, which, in turn, puts further pressure on water resources. Between 2000 and 2050, the demand for water by industry is expected to increase by 400 per cent.

But while demand for water rockets - it is expected to increase by 55 per cent by 2050 - and

20 per cent of global groundwater sources are already overexploited, it is still not being managed sustainably. Intensive crop irrigation, uncontrolled release of pesticides and chemicals into watercourses and the absence of wastewater treatment - which is the case for 90 per cent of wastewater in developing countries – are all proof of this state of affairs.

## **Development is putting a strain on water**

The environmental cost of practices like these is high. It means wide-scale water pollution and significant wastage. In the North China Plain, intensive irrigation has caused the water table to drop by over 40 metres. The environmental cost is also seen in terms of the sometimes irreversible damage to many ecosystems across the world, especially in wetlands and coastal areas. This substantially reduces their capacity to perform vital ecosystem services such as water purification and storage.

Climate change only adds to this pressure. The increased variation in rainfall and rising temperatures lead to greater evaporation and transpiration by vegetation. Meanwhile, sea level rise is threatening groundwater in coastal areas. Just like Calcutta (India), Shanghai (China) and Dacca (Bangladesh), other cities are finding their groundwater reserves are being contaminated by salt water. The picture is the same in the Pacific islands of Tuvalu and Samoa, whose inhabitants increasingly depend on imported water to satisfy their needs, as their own groundwater has become too salty.

According to the authors of the report, this growing pressure on water resources is also likely to lead to greater competition between sectors, as well as between regions and nations.

The time has therefore come for us to change the way we assess, manage and utilise this resource, the report stresses, pointing to failures in our governance of water. Water is too cheap, compared to its real value, and is rarely taken into account when decisions are made regarding energy and industry. In general, decisions that determine how most of water is used are taken by a limited number of players (public, parapublic and private) and follow a logic dictated by short-term goals, rather than environmental concerns.

## **The virtuous circle of sustainable development**

The report emphasises the role of public authorities in influencing the strategic choices that will guarantee a lasting future for our water resources. In particular it recommends limiting the development of thermal power stations that, today, produce 80 per cent of our electricity and consume vast quantities of water. This could be achieved, for example, by granting subsidies to renewable energies such as wind and solar, which are still relatively expensive. It could also mean rewarding farmers who use efficient irrigation methods. For example, in an arid country like Cyprus,

subsidies like this have led to a major change in farmers' attitudes towards irrigation techniques and the imposition of techniques that consume less water.

The transition towards more sustainable models of production comes at a cost, but as the report points out, such investments are part of a virtuous circle. Indeed, studies show that for every dollar invested to protect a catchment area up to \$200 can be saved on water

treatment. So, while \$235,000 are needed annually to optimise the treatment of waste in order to maintain the Nakivubo marshlands in Uganda ecologically intact, this ecosystem provides a water purification service for Kampala that is estimated to be worth USD 2 million per year. In New York, managing the upstream catchment areas saves the city an estimated USD 300 million a year.

The efforts that some countries are making show that better governance and more careful use of water are possible, including in developing countries. The water authorities in Phnom Penh (Cambodia) are a case in point. This organisation, once accused of corruption and on the verge of bankruptcy has, in the space of a decade, become one of the world's most efficient water suppliers. It has reduced water losses from 60 per cent in 1998 to 6 per cent in 2008, which is equivalent to Singapore's entire water supply.

As the United Nations prepares to adopt the future Sustainable Development Goals for 2030, the report points to the need to devote an entire goal to water. It argues that the focus be extended from drinking water and sanitation - as was the case in the Millenium Development Goals - to the global management of the whole water cycle. The proposed SDGs would thus take into account questions of governance, water quality, wastewater management and the prevention of natural disasters. The Sustainable Development Goals will be finalised in the autumn of 2015 during the United Nations General Assembly.

The United Nations World Water Development Report is the result of collaboration between the 31 agencies of the United Nations system and the 37 international partners that make up UN-Water. It is produced by the World Water Assessment Programme (WWAP), hosted by UNESCO. The report presents an exhaustive account of the state of the world's water resources and, up until 2012, was published every three years. Since 2014 it has become an annual publication, devoted to a specific

theme. Its publication is now timed to coincide with World Water Day, whose theme is also aligned with that of the report.

“Ahead of World Water Day, UN Calls for Better Management of Water Resources”, 20/03/2015, online at:

<http://unep.org/newscentre/Default.aspx?DocumentID=26788&ArticleID=34820&l=en>

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