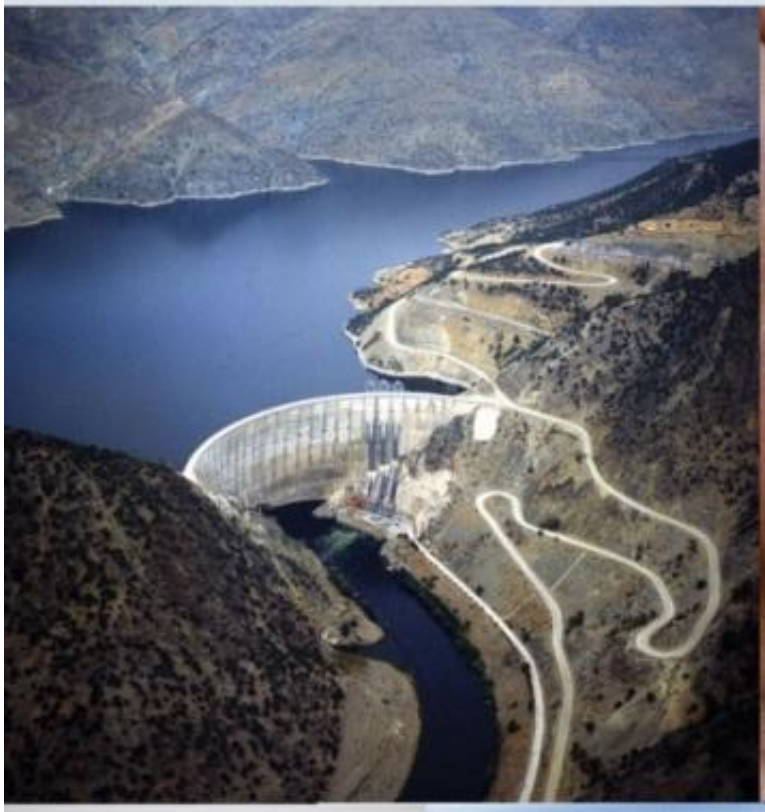


ORSAM WATER BULLETIN

Weekly Bulletin by ORSAM Water Research Programme

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





Issue 138

ORSAM WATER BULLETIN

22 July – 28 July 2013

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❖ Disi Water Conveyance Project in Jordan

The first phase of a project to carry water from the Disi aquifer, part of which is located in southern Jordan, to Amman and other provinces was completed last week, starting the conveyance of water.

In the first phase, Amman, Zarqa, Mafraq and Irbid will be supplied with water which will then be transported to Jerash, Ajloun, Madaba, Karak, Tafileh and Maan. Through the project, which is intended to contribute to economic development, the water problem in Jordan is expected to be solved.

The conveyance system, constructed by project partner GAMA in Turkey, is designed to pump 100 million cubic meters of high quality water per year from the Disi aquifer in southern Jordan via a 325-kilometer steel pipeline for some 25 years.

Dr. Hazem Al Nasser, the Jordanian minister of water and irrigation, states that Amman is currently supplied with 400,000 cubic meters of water a day. Through partial conveyance of water, this figure will reach 510,000-530,000 cubic meters. The people in Amman will have access to water four times a week when the project is completed. The minister of water and irrigation asserts that Jordan's annual water needs, currently at 900 million cubic meters, will be 1.6 billion cubic meters by 2015. The population of Jordan in 2012, which has a 3.5 percent population growth rate, is 6.31 million. Along with the expansion of agricultural land and a growing population, the increase in water consumption and the rising number of Syrian immigrants predominantly situated in Mafraq are putting pressure on the country's water resources.

On a per capita basis, Jordan has the lowest level of water resources in the world. While the Jordan Rift Valley has a semi-tropical climate due to its location, a Mediterranean climate prevails in the highlands of the country while a continental climate prevails in eastern deserts and plains. Although precipitation changes depending on the topography, it is lower than 200 millimeters across the country. This figure is about a fifth of the world average. The amount of the country's renewable water resource is 937 million cubic meters. According to 2011 Food and Agriculture Organization (FAO) statistics, the amount of water per capita per year is 148 cubic meters.

The Disi aquifer, which serves as a donor basin in water transfer, is a non-renewable, transboundary fossil groundwater conveyance system. It is estimated that the aquifer, which lies along the border between Jordan and Saudi Arabia, is 320 kilometers long, 600-900 meters wide and contains 280 billion cubic meters of quality water. It is the largest aquifer of its kind in the Middle East. The safe yield of the sandstone Disi aquifer, which is approximately 30,000 years old, is 125 million cubic meters per year for five decades.

The Disi water conveyance project is not the only project being conducted on the aforesaid aquifer. Along with the investments in irrigation in Jordan during the mid-1980s, 3,000 hectares of land were

irrigated under the Disi Irrigation Project. Jordan is not the only country that predominantly uses the Disi aquifer. Saudi Arabia also began to largely use the aquifer during the mid-1980s for agricultural purposes. Saudi Arabia draws more than 1,000 cubic meters of water from the Disi aquifer per year. There is no bilateral agreement regarding the use of this transboundary aquifer between the two countries. The construction of the Disi Water Conveyance Project was undertaken without any consultation or agreement with Saudi Arabia. Hydropolitics experts assert that this situation might lead to a problem between the two countries in the future.

Jordan signed the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses, but Saudi Arabia is not a party to this agreement. Article 2 of the convention defines "watercourse" as "a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus." Given the definition, renewable transboundary aquifers could be included in this system, but fossil aquifers that have nothing to do with surface water like the Disi aquifer cannot be included in the article mentioned above. Besides, even if there are draft agreements, there is no agreement yet that includes fossil aquifers. A forum to share general information and statistics on the use of aquifers between the two countries was formed, but it has not been active due to the reluctance of Saudi Arabia.

On the other hand, excessive use of the Disi aquifer, which cannot be renewed and will completely dry up one day, has been criticized. It is asserted that the aquifer must be protected for the future welfare of the two riparian countries and to conserve it for the future generations as well.

"Disi Water Conveyance Project in Jordan", Tuğba Evrim Maden, Todays Zaman, 28/07/2013, online at: http://www.todayszaman.com/news-322014-disi-water-conveyance-project-in-jordan.html

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❖ Tehran's daily water consumption stands at 3.350 million cubic meters

Tehran province's water consumption reached to 3.350 million cubic meters per day during last days due to rise of temperature, the Managing Director of Tehran Water and Wastewater Company Mohammad Parvaresh said, Mehr news agency reported.

Tehran's temperature reached to 42.4 degrees which caused capital's water consumption marked a new record in the past 2 days, the report said.

According to the report, average water consumption figure in Tehran stands on 2.700 million to 3 million cubic meters per day.

Tehran's water consumption volume has passed 3.200 million cubic meters just 7 days during past years, while the volume has surpassed the figure in 22 days of current solar year(started on March 21), Parvaresh said.

"Last day water volume in the reservoir which stored for extraordinary days decreased from 1.300 million cubic meters to 800,000 cubic meters," he said, adding that water consumption is 200,000 cubic meters more than water supply network's capacity.

Tehran Water and Wastewater Company announced in a statement on July 25 that Tehran province's water consumption is alarmingly high.

"If the consumption trend and the high temperature continue, there could be water shortages in Tehran in the coming days," the company announced previously, also asking the citizens to consume water responsibly.

According to the reports, Tehran's people experienced water interruption for few hours in some parts of capital, yesterday.

"Each 0.5 to 1 degree rise in the temperature will lead in the consumption of additional 100,000 cubic meters of water in the capital," the company added.

The Managing Director of Tehran Water and Wastewater Company Mohammad Parvaresh said on July 21 that Tehran province's water consumption has increased by 11 percent in summer compared to previous year.

Parvaresh also urged the citizens to decrease their water consumption, the IRNA News Agency reported.

Alireza Nozaripour, an official with Tehran Water and Wastewater Company said in June that Iran's precipitation faced a 30-percent decrease in the previous calendar year, which ended on March 20.

According to him, the reservoir of the country's dams has also decrease by 40 percent.

"Tehran's daily water consumption stands at 3.350 million cubic meters", 26/07/2013, online at: http://en.trend.az/regions/iran/2174409.html

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❖ Iran`s capital rainfall decreases by 58 percent

Rainfall in Tehran province has decreased by 58 percent during first three months of the current solar year (started on March 21) compared to the normal rainfall state, faculty member of Iran's Meteorological research Institute, Abbas Ranjbar said, Mehr news agency reported.

"Tehran's average rainfall during first 10 months of current crop year (started on September 22, 2012) reached 243.1 millimeters, which indicates a 24 percent fall compared to the normal figure of 317.9 millimeters," he said.

It should be noted that, total rainfall was 417.1 millimeters during the same period last year, which was 31 percent more than normal rainfall.

Average rainfall in Iran reached 215 millimeters during this period, which has decreased by 5 percent compared to the normal figure of 227.4 millimeters, Ranjbar added.

This rainfall is not enough to offset the effects of drought, he argued.

Water shortage has always been a pressing problem in Iran due to its arid and semi-arid climate, and droughts. As international sanctions clamp down on the country, this issue has gained increased importance.

Iran has experienced several droughts in recent years, especially in the south where it gets hit by violent sand storms that engulfed several cities.

Sand storms particularly enter Iran from neighboring Iraq where desertification has increased over the last two decades due to wars.

"Iran`s capital rainfall decreases by 58 percent", 25/07/2013, online at: http://en.trend.az/regions/iran/2173991.html

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❖ Iran: Villages lack drinking water in northern provinces

NCRI - One of the main problems of the villages in the northern provinces is the lack of drinking water.

Villagers in the province of Golestan are forced to provide their drinking water by bringing water from the cities with tankers.

The villages lacking most drinking water are Gonbade Kavous and Merah Hill which are among the most deprived people of this province.

In addition to these villages, other towns including Kalaleh Varamian, Minoudasht, Kordkuy and Azad shahr are suffering water shortage.
There hasn't been any measures taken so far from the government to solve this problem.

"Iran: Villages lack drinking water in northern provinces", 29/07/2013, online at: http://www.ncr-iran.org/en/news/economy/14054-iran-villages-lack-drinking-water-in-northern-provinces

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❖ Iranian, Iraqi Officials Discuss Cooperation in Water, Power Industries

The discussions took place in a meeting between Iranian Deputy Energy Minister for Research and Human Resources Alireza Qassemi Pourafshar and an Iraqi delegation on Wednesday.

During the meeting, Qassemi Pourafshar voiced Iran's readiness to train Iraqi workforce in the water and power industries.

He said signing agreements between Iranian and Iraqi officials for promotion of mutual cooperation in the field of water and power industries would help boosting bilateral ties and cooperation.

Meanwhile, the Iraqi side welcomed Iran's offer, and expressed the hope that Baghdad could benefit from Tehran's rich experiments in the fields of water and power industries.

Iran and Iraq have enjoyed growing ties ever since the overthrow of the former Iraqi dictator, Saddam Hussein, during the 2003 US invasion of the Muslim country.

Both sides are working on a series of plans to take wide strides in expanding their ties, in economic fields in particular.

"Iranian, Iraqi Officials Discuss Cooperation in Water, Power Industries", 25/07/2013, online at: http://english.farsnews.com/newstext.aspx?nn=13920503000721

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❖ Iranian radiation a threat to GCC water security?

In mid-July 2013, the GCC Secretariat General said that GCC member states are planning a joint water supply system that takes seawater from outside the Gulf and will distribute drinkable water across the Arabian Peninsula. GCC Assistant Economic Secretary Abdullah J. al-Shibli said: "The water link is to build a line from the Arabian Sea or Gulf of Oman to Kuwait passing through the GCC countries. With the Iranian nuclear plant in Bushehr, if something goes wrong the water in the Gulf would be polluted."

Following a 6.3-magnitude earthquake that struck close to the Iranian nuclear power station earlier this year, GCC national emergency officials of the Gulf Cooperation Council (GCC) countries met in Saudi Arabia on April 14 to discuss the potential crisis that could arise from radiation spreading throughout the Persian Gulf. GCC Secretary-General Abdulatif al Zayani, said Gulf Arab states "must have a joint plan to collectively deal with any possible leakage from the Iranian nuclear plant." This development goes to the heart of unifying the GCC as proposed by King Abdullah in 2011. Indeed, water security is paramount along the 3,240km Arabian Gulf coastline and is a major concern regarding the health security of GCC citizens and expatriates.

In case of an accident…

The risk of radiation from Iran's Bushehr nuclear power plant, if there is an accident, is extremely high to the GCC states. Studies and analyses suggest that any leak from the plan will affect the GCC's water supplies especially desalinization plant operation. In the event of a radiation leak, clouds of radioactive material will drift to the GCC states in just 15 hours. While the radiation would affect only about 10 percent of the Iranian population, in the GCC states, 40 to 100 percent of the population would be affected. Not only would drinking water be affected, but also the environment and the shipping of oil and natural gas and other maritime goods and services.

Not only would drinking water be affected, but also the environment and the shipping of oil and natural gas and other maritime goods and services.

Dr. Theodore Karasik

Bushehr's long and sorted history comes into play when discussing water security in the Arabian Gulf. Iran's only nuclear power plant began construction began nearly 35 years ago and "second-grade" engineers worked on it, while the technology used was sub-par German and Russian equipment, according to The Times of London. Two more reactors are reportedly to be built at the

site. In addition, the Bushehr plant is located in a major earthquake zone prone to many large, damaging shifts in the earth's crust. Given the 2011 Fukushima Daiichi nuclear disaster after a massive earthquake, one can assume that any such event at Bushehr would be catastrophic and the impact would last for years. Finally, Iran's nuclear power plant does not belong to the Convention on Nuclear Safety.

The GCC, based on a unifying principle of mutual cooperation in the face of such a water-borne radiation threat, are looking at solutions for tainted Gulf waters. Efforts are under way to link the Gulf Cooperation Council states with a water pipeline at a cost of $1 billion. Officials say the project, similar to the GCC power grid, is expected to be ready by 2020.

GCC states depend heavily on desalinated water. Due to a lack of natural water resources, the GCC states depend almost entirely for potable water. GCC governments are taking the issue of high water consumption seriously from desalinization and have initiated measures to rectify the issues. With fresh groundwater sources dwindling, the focus has shifted to the supplementary non-conventional sources, including desalination of sea water and treatment of recycled waste water. At present, more than 45 desalinization plants are operating in the six GCC countries, producing two-thirds of global desalinization capacity. In addition, desalinization also discharges salt back in the Arabian Gulf so any radiation accident from Iran's Bushehr would halt these operations.

GCC governments—at the state level- are taking the issue of high water consumption seriously and are initiated measures to rectify potential, catastrophic problems. Recent reports state that 80 percent of water is used for agricultural purposes in the rural areas of GCC countries and also holds very less percentage of GDP to the economies. For instance, Saudi Arabia is making plans to phase out the purchases of locally produced wheat by 2016 to reduce the burden of farming imposed on the Kingdom's water resources. The UAE Ministry of Water and Environment is taking a national initiative in water conservation by the construction of 68 more recharge dams. These recharge dams are designed to replenish the groundwater reserve during rain storms and collect more freshwater that comes from natural springs and wadi flooding. Kuwait, Qatar, and Bahrain are instituting other measures as well.

Consequently, the idea for a unified water supply system reliant on alternative water sources outside of the Arabian Gulf itself is a viable and necessary solution. Planning and construction of such a pipeline is in the works and hopefully will be online before any possible radioactive accident at Iran's

Bushehr plant. The GCC, is moving forward at the inter-state level coupled with state by state resource programs helping to boost water resource protection and security for all inhabitants.

"Iranian radiation a threat to GCC water security?", 24/07/2013, online at: http://english.alarabiya.net/en/views/news/middle-east/2013/07/24/Iranian-radiation-a-threat-to-GCC-water-security-.html

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❖ $32.7 billion investment in renewable energy and water projects in Middle East

The Middle East's energy sector is experiencing a surge in its water and renewable energy investment with nearly 100 projects, worth US$32.7 billion, initiated this year, a market research report revealed on Tuesday. Gulf Cooperation Council (GCC) states, witnessing the biggest public spending rise in years, are set to benefit the most from new and upgrading of existing water and power projects.

Construction on ten power and water projects worth $1.5 billion began in the UAE this year, including the $740 million Noor 1 solar power plant, and Phase 2 of the Emal Power Plant, worth $580 million.

Kuwait approved 19 power and water projects worth $4.2 billion, including the $2.7 billion Al Zour North Independent Water and Power Plant.

Meanwhile, Saudi Arabia kickstarted 15 fresh projects worth $8.8 billion in 2012, with the $2 billion worth Al Qurayyah Independent Power Plant, and the $1.2 billion Shuaiba 2 Power Plant taking the lead.

According to the World Energy Council, the Gulf region alone will require 100 gigawatts (GW) of additional power by 2020 to meet increased demand, surging at 7.7% annually.

Other Mid East countries launching new water and power projects this year include Oman, Qatar, Bahrain, Jordan, Iraq, Yemen, Syria, and Egypt.

Morocco leads the race in North Africa after injecting $4.4 billion into seven projects this year. Rabat laid strong emphasis on renewable energy with Ouarzazate solar power in Olant (pictured above), and four wind farms in Taza, Laayoune, Tetouan, and Tangier, all set to thrust the Saharan nation into becoming a renewable energy leader in the region.

Future Planning

Several regional governments are ramping up efforts to invest more in natural resources capacity as population in the Middle East is expected to grow by 31% by 2025, reaching 500 million, putting a significant strain on dwindling water resources.

The Middle East is one of the regions in the world where water is very scarce, resulting in significant investment in water infrastructure and non-traditional water technologies such as desalination and wastewater re-use – of which the region is emerging as a world leader.

Market research specialists Ventures Middle East released the figures ahead of the Power + Water Middle East Forum, that will take place from 8 to 10 October at the Abu Dhabi National Exhibition Centre in Abu Dhabi, UAE. Held in partnership with Abu Dhabi Water & Electricity Authority (ADWEA), with Abu Dhabi Chamber of Commerce and Industry (ADCCI) as a strategic partner, Power + Water Middle East is the region's premier event for showcasing power and water related products and services.

"Growing demand and rapid industrial developments has enabled Middle East countries to continue their run as the most dynamic power and water sectors in the world," Anita Mathews, Exhibition Director for Power + Water Middle East, said.

"Power consumption in the MENA region has been growing significantly and is poised to grow at a faster pace in the years to come. Power + Water Middle East 2012 will provide the meeting place for regional and international suppliers of products and services that will drive investment in the future."

Organisers of the event said in a statement that the exhibition has so far attracted more than 100 exhibitors from 25 countries wishing to network and offer solutions to regional power generation, water and nuclear energy industries.

"$32.7 billion investment in renewable energy and water projects in Middle East", 26/07/2013, online at: http://www.climateactionprogramme.org/news/32.7_billion_investment_in_renewable_energy_and_water_projects_in_middle_ea/

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❖ Water Crisis in the Middle East

What if there is a crisis at Iran's Bushehr nuclear plant on the Persian Gulf? How would radioactive contaminated sea water affect the desalination plants of other countries which are located on the Persian Gulf?

Iran's Bushehr nuclear plant a threat to Gulf water plans

The concerns are over a possible disaster at the Bushehr plant, which sits on an active seismic zone on the other side of the Arabian Gulf.
In the near-absence of natural water resources, the GCC states depend almost entirely for potable water on the shallow sea, whose water they desalinate at huge costs.

In that sense, and also because the GCC's oil and gas exports are shipped through the Gulf, this shallow body of water is the lifeline of these countries and their people.

Saudi Arabia: The Desalination Nation | ASHARQ AL-AWSAT

Saudi Arabia is facing a water crisis. Despite the kingdom's massive investments in desalination plants, demand is growing at a rate that threatens to outstrip supply, leading to the formulation of ambitious plans for the expansion of its desalination plants at a cost of tens of billions of dollars, amid calls from experts for urgent reforms of subsidies and water use.
Saudi Arabia is considered among the poorest countries in the world in terms of natural renewable water resources. It is a desert country with little precipitation and no rivers or lakes, leaving it dependent on an extensive infrastructure of costly and energy-intensive water desalination plants. The state-owned Saline Water Conversion Corporation (SWCC) operates 36 stations on the east and west coasts of the country, mostly on the Red Sea coast.

The kingdom is in urgent need of huge investments in order to address the annual increase in demand, which is among the highest in the world, coupled with the added strain of a population growth rate of more than 2.5%.

Saudi economic analyst Turki Al-Haqeel said that the demand for water in Saudi Arabia is growing by more than 8.8% annually and could more than double over the next two decades, which will in turn increase pressure on oil consumption, affecting the structure of the Saudi economy.

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How Yemen Chewed Itself Dry | Foreign Affairs

In a little over a decade, Sana'a, Yemen, may become the world's first capital to run out of water. Failed governance and environmental mismanagement share some of the blame for drying up the city. But there is also a more surprising culprit: a national addiction to qat, a narcotic that is incredibly water-intensive to cultivate.
If current trends continue, by 2025 the city's projected 4.2 million inhabitants will become water refugees, forced to flee their barren home for wetter lands. In preparation, some officials have already considered relocating the capital to the coast. Others have proposed focusing on desalination and conservation to buy time.

As policymakers butt heads over the best course for Yemen, the dwindling water supply is already leading to instability: according toAl-Thawra, one of the country's leading newspapers, 70 to 80 percent of conflicts in Yemen's rural regions are water-related. And across the country, Yemen's Interior Ministry estimates, water- and land-related disputes result in about 4,000 deaths each year — 35 times the number of casualties in the deadliest al Qaeda attack in the county's history.

As Gaza heads for water crisis, desalination seen key – Israel Business, Ynetnews
With 90-95% of Strip's only aquifer contaminated by sewage, chemicals and seawater, public taps provide water for only about 20% of population, forcing many more residents to buy bottled water at a premium

Iran Becoming 'Uninhabitable,' Says Former Agriculture Minister | Iran Pulse: Must-Reads from Iran Today
On Iran's water crisis, Kalatantari said, "Our main problem that threatens us, that is more dangerous than Israel, America or political fighting, is the issue of living in Iran. It is that the Iranian plateau is becoming uninhabitable … groundwater has decreased and a negative water balance is widespread, and no one is thinking about this."

Kalantari continued, "I am deeply worried about the future generations. There has been livelihood in Iran for 7,000 years. We do not have a right with this lack of planning to confront the country with this great of a challenge." On whether others have noticed this issue, Kalantari said, "I have said it everywhere. If this situation is not reformed, in 30 years Iran will be a ghost town. Even if there is precipitation in the desert, there will be no yield, because the area for groundwater will be dried and water will remain at ground level and evaporate."

Middle East facing water shortage crisis – UPI.com

The AGU study, published in its journal Water Resources Research Feb. 15, showed that freshwater reserves in Turkey, Syria, Iraq and Iran along the Euphrates and Tigris rivers that rise in Turkey and flow southward into the Persian Gulf have lost 144 cubic kilometers of the total stored fresh water in 2003-09.

That, the study says, constitutes the second fastest loss of groundwater storage after India.

The main reasons for this loss of water were listed as increased demand, poor management — a perennial problem in the Arab world — and the impact of the devastating 2007 drought, whose effects are still being felt. Over pumping of ground water was the primary cause.

With water run-off in the region expected to decline 10 percent by 2050 and demand set to rise 60 percent by 2045, "these findings have heightened concerns of an impending regional water crisis," Oxford Analytica said.

The region's main rivers — the Euphrates, Tigris and Nile — are the focus of major water disputes, with little prospect any of them will be resolved in the foreseeable future.

Losing the Nile

Egypt has long held unrivaled "historic rights" over nearly all of the Nile River's resources. But now all that could be changing as upstream states like Ethiopia and Burundi seize on Egypt's post-revolution political uncertainty to finally wrest at least some control of the world's longest river. The result could be mean dire food and water shortages for Egypt, and maybe another revolution.

"Water Crisis in the Middle East", 25/07/2013, online at: http://www.1913intel.com/2013/07/25/water-crisis-in-the-middle-east/?utm_source=rss&utm_medium=rss&utm_campaign=water-crisis-in-the-middle-east

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❖ Palestine City Council OKs new equipment purchase, water pump repair expense

PALESTINE — Palestine City Council kept Monday's regular city council meeting short and sweet.

During the 30-minute meeting, council members approved a budget amendment allowing the Code Enforcement Department to replace the city's mosquito sprayer.

The city's old sprayer broke down and, according to city officials, replacement parts are no longer available for the apparatus.

"This is the prime time of year (for mosquitoes) — we really felt the need to stay on top of this," interim City Manager Wendy Ellis said. "Especially with the West Nile case reported this year."

Ellis explained the department had $8,623.88 — the cost of the new sprayer — in the budget under the department's contract services line item and was requesting the budget amendment to move salary funds for a vacant position to the contract services fund to cover the cost of the new equipment.

"The contract services are the funds the city uses to demolish substandard housing and address other code violations like mowing and that kind of thing," Ellis said. "Using the funds already budgeted for the vacant position will enable the department to continue with those efforts as well."

Council members approved the request.

"I've noticed the efforts in cleaning up those substandard homes," Councilman Vernon Denman Jr. said. "I think that's a very positive thing for our community."

Ellis added those projects are a cooperative effort between the city's Development Services and Street departments.

In other business, the Council approved a $13,812 expenditure to repair the city's 300 horsepower raw water pump at raw water pump station No. 2.

Utilities Director Robert Sedgwick told council members the pump's check valve malfunctioned after a power outage occurred at the station on July 14.

"When the power went out, it slammed shut and broke the check valve," Sedgwick said.

He recommended a 14-inch buffer swing check valve from Flowtech that closes slowly using hydraulic oil. Other bids included a stainless steel value which could break again under similar conditions and another hydraulically operated valve which would include a strainer and add significant operation costs.

The funds would come from the department's Water Treatment fund, which currently has $86,364 remaining in it.

"Palestine City Council OKs new equipment purchase, water pump repair expense", 23/07/2013, online at: http://palestineherald.com/localscene/x541279845/Palestine-City-Council-OKs-new-equipment-purchase-water-pump-repair-expense

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❖ As Gaza heads for water crisis, desalination seen key

With 90-95% of Strip's only aquifer contaminated by sewage, chemicals and seawater, public taps provide water for only about 20% of population, forcing many more residents to buy bottled water at a Premium

A tiny wedge of land jammed between Israel, Egypt and the Mediterranean sea, the Gaza Strip is heading inexorably into a water crisis that the United Nations says could make the Palestinian enclave unlivable in just a few years.

With 90-95% of the territory's only aquifer contaminated by sewage, chemicals and seawater, neighborhood desalination facilities and their public taps are a lifesaver for some of Gaza's 1.6 million residents.

But these small-scale projects provide water for only about 20% of the population, forcing many more residents in the impoverished Gaza Strip to buy bottled water at a premium.

"There is a crisis. There is a serious deficit in the water resources in Gaza and there is a serious deterioration in the water quality," said Rebhi El Sheikh, deputy chairman of the Palestinian Water Authority (PWA).

The Gaza Strip, governed by the Islamist group Hamas and in a permanent state of tension with Israel, is not the only place in the Middle East facing water woes.

A NASA study of satellite data released this year showed that between 2003 and 2009 the region lost 144 cubic km of stored freshwater – equivalent to the amount of water held in the Dead Sea – making an already bad situation much worse.

But the situation in Gaza is particularly acute, with the United Nations warning that its sole aquifer might be unusable by 2016, with the damage potentially irreversible by 2020.

Only 5 to 10% of the aquifer's water is presently deemed safe to drink, but even this can mix with poor quality water during distribution, making it good only for washing.

"The tap water from the municipality is not fit to drink, and my husband is a kidney patient," said Sahar Moussa, a mother of three, who lives in a cramped, ramshackle house in Khan Younis in the southern Gaza Strip, near the Egyptian border.

She spends NIS 45 ($12.50) each month – a large sum for most Palestinians in the area – to buy filtered water that she stores in a 500-litre plastic tank.

Further complicating the issue is Israel's blockade of the Gaza Strip, which activists say has prevented the import of materials needed for repairs on water and waste facilities. Israel says the

blockade is needed to prevent arms from reaching Hamas, which is opposed to the existence of the Jewish state.

The United Nations estimates that more than 80% of Gazans buy their drinking water.

"Families are paying as much as a third of their household income on water," said June Kunugi, a special representative of the UN children's fund UNICEF.

Salt and sewage

With no streams or rivers to speak of, Gaza has historically relied almost exclusively on its coastal aquifer, which receives some 50-60 million cubic meters of refill each year thanks to rainfall and runoff from the Hebron hills to the east.

But the needs of Gaza's rapidly growing population, as well as those of the nearby Israeli farmers, means an estimated 160 million cubic meters of water is drawn from the compromised aquifer each year. As the levels sink, seawater seeps in from the nearby Mediterranean.

This saline pollution is made worse by untreated waste, with 90,000 cubic meters of raw sewage allowed to flow into the shallow sea waters each day from Gaza, according to UN data.

Even with the aquifer, regular running tap water is a luxury unknown to many Gazans. Locals across the territory say that during the summer months water might spurt out of their taps every other day, and the pressure is often so low that those living on upper floors might see just a trickle.
Many families have opted to drill private wells drawing from water deep underground.

Authorization is required but rigid restrictions mean most households dig their wells in secret. Hired laborers erect large plastic sheets to try and hide their work from prying neighbors.

"As you can see, this is like a crime scene," said a 45-year-old father of six, who gave his name as Abu Mohammed.

A clothes merchant from Gaza city, he paid his clandestine, seven-strong crew NIS 12,700 ($3,513) to drill a well and came across water at a depth of 48 meters. "We begin the work after sunset and ... cover the sound of digging with music," he said.

A senior Israeli security official estimates that as many as 6,000 wells have been sunk in Gaza, many without authorization.

While Israel shares the polluted aquifer, which stretches all the way to Caesarea, about 60 kilometers (37 miles) north of Tel Aviv, the problem is less acute than in Gaza which is downstream. In addition, Israel can access water from the Sea of Galilee and the mountain aquifer that also spans the West Bank.

Power failure

As Gaza borders the sea, the obvious answer is desalination.

Gaza already hosts 18 small plants, one treating seawater and the others water from brackish wells - most of them supplied by UNICEF and the OXFAM charity.

The Palestinian Water Authority has started work on two new seawater desalination plants and is planning to construct a third, larger facility, which is designed to produce 55 million cubic meters of water a year.

But with funding for the $450 million project still uncertain, construction is not due to start until 2017.

By that time, cash-strapped Gaza may not have enough electricity available to power the energy-intensive plants. The United Nations estimates that Gaza already needs an additional 100 megawatts of production capacity, even before the big water facility is built.

Israel is trying to drum up aid for the territory, the senior security official said, alarmed at the prospect of a looming water catastrophe and possible humanitarian crisis on its doorstep in a few years.

"We have talked to everyone we know in the international community because 1.4 million people will be without water in a few years," he said, asking not to be named because of the sensitivity of the issue.

He said Israel, a leader in the desalination industry, was helping to train a handful of Gazans in the latest water technology, which the Palestinian Water Authority confirmed.

Sheikh called on international donors to help fund energy, water and sewage projects, warning of disaster if nothing happened.

"A small investment is needed to avoid a bigger one and it is a humanitarian issue that has nothing to do with politics or security," he said.

"As Gaza heads for water crisis, desalination seen key", 22/07/2013, online at:
http://www.ynetnews.com/articles/0,7340,L-4399067,00.html

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❖ Southern Water agrees to remove Israeli-manufactured water meter for Brighton pro-Palestinian customer

A water firm has agreed to remove its Israeli-manufactured water meter for a pro-Palestinian customer.

Palestinian human rights activists believe Southern Water's Israeli-manufactured meters should be boycotted in objection to "repression of Palestine."

The meters are made by Arad Technologies, a company accused of working in "illegal Israeli settlements" in the West Bank after installing 3,200 water meters in settlement industrial zones.

Caroline and Edmond O'Reilly, from Brighton, asked Southern Water to remove their Arad meter in June and received a reply from its head of metering last week.

Mrs O'Reilly said: "The letter said they would be round to change my meter this week because of my concerns over its origin.

"I've now got a model that's been refurbished, instead of the new ones they've bought from Arad."

Mrs O'Reilly, said her objection to the installation of Arad's meters was based on the "fact" the "Israeli Government has illegally, according to the International Court of Justice and United Nations resolution, settled in Palestinian land."

She said: "Since 2000 the Israelis have systematically destroyed the Palestinian water supply infrastructure.

"Arad supplies the Israeli government and so these illegal settlements. Should we turn a blind eye, we collude in supporting a system that is systematically discriminating against people who are powerless against a state that seems to be attempting to drive Palestinians out of Palestine."

Arad secured a £36 million contract with Southern Water in February 2010 to provide meters, meter reading services and data hosting services across Hampshire, Surrey, Kent and Sussex.

A Southern Water spokesman said: "We have no political comment or opinion on this matter.

"However we are not an intransigent company, we listen to our customers and all requests will be considered on a case-to-case basis."

"Southern Water agrees to remove Israeli-manufactured water meter for Brighton pro-Palestinian customer", 26/07/2013, online at:
http://www.theargus.co.uk/news/10572721.Water_firm_agrees_to_remove_Israeli_manufactured_water_meter_for_customer/

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❖ Millennium Dam: Facts and Fallacies (6)

The Political Concerns: U.S. strategy in the Nile Basin

The U.S. interest in the Nile waters goes back to the sixties of last century in support to the Haile Selassie regime in Ethiopia at that time in a step against the support and financing of the Soviet Union to the construction of the High Dam in Egypt and because of their close link to President Gamal Abdel Nasser who was at the time leading the Middle East against American policies in the area. So In response to the High Dam project, Ethiopia thought to invest in the Nile water. The U.S. supported the trend by conducting studies on the river to see the possibility of generating electric power.

In this century the U. S. has been wary of the Chinese infiltrations in the African Continent. So when Ethiopia in 2010 built its Takazi-Atbara Dam with Chinese funding the worries of the Americans escalated again.

According to some papers and documents published by the U.S. State Department that the United States sees water issues and environment concerns threaten the stability and development in the Arab, African worlds, and will be one of the causes of wars and tensions. So the Bureau of Intelligence and Research of the Ministry of Foreign Affairs (INB) began studying the water problems in the priority area. Also In this context the (U.S. Bureau of Land Reclamation in 1964 made a comprehensive study of Ethiopia at the level of the arable land and the level of the construction of dams for water storage and hydroelectric power generation).

The Strategic and International Studies Center in Washington (CSIS) issued a study in 1988 about U.S. foreign policy over the water resources in the Middle East in order to pursue a strategy for the future to promote American interests in the region. The study identified the water crisis in Nile River basin and its treatment.

On the same subject the Strategic and International Studies Center at the University of George Town issued, in the first of February 2003, a booklet titled "the campaign against terrorism and the war on Iraq: the entrance to other confrontation mechanisms". The study stated that there is no weapon better or more successful than water to be used against Egypt and Sudan, and as the Nile waters are the source of life for each of Egypt and Sudan, they also can be used as the source of their destruction.

"Millennium Dam: Facts and Fallacies (6)", 24/07/2013, online at:
http://news.sudanvisiondaily.com/details.html?rsnpid=225145

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❖ Egypt Rules Out War With Ethiopia Over Nile River Hydropower Dam

Egypt has no plans to go to war with Ethiopia over the Horn of Africa nation's construction of a hydropower dam on the Nile River, said Mona Omar, special envoy for Interim Egyptian President Adly Mansour.

Former Egyptian President Mohamed Mursi told supporters last month his government will "defend each drop of Nile water with our blood." Mursi, overthrown by the army on July 3, had a failed foreign policy and Egypt plans to negotiate with Ethiopia about the dam, Omar told reporters today in the Ugandan capital, Kampala.

"We cannot go to war with any African country," she said. "When you differ in opinion it doesn't mean you will go to war."

Ethiopia is building a $4.3 billion, 6,000-megawatt hydropower plant on the Blue Nile River, the main tributary of the Nile River that provides Egypt with most of its water. The dam, to be completed by 2017, has raised concerns in Egypt that it will cut supplies of water allocated by accords put in place more than five decades ago.

The project, known as the Grand Ethiopian Renaissance Dam, is set to be Africa's biggest hydropower plant when it is built.

"Egypt Rules Out War With Ethiopia Over Nile River Hydropower Dam", 26/07/2013, online at:
http://www.businessweek.com/news/2013-07-26/egypt-rules-out-war-with-ethiopia-over-nile-river-hydropower-dam

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❖ Egypt warns Ethiopia over plans to build dam on river Nile

The Egyptian interim government of President Adly Mansou has warned Ethiopia over plans to build a giant dam on the river Nile, saying it will reduce water flows vital for its 84 million people.

Addressing the press at the media center in Kampala on Friday, the country's director of Nile Basin countries affairs, Mohamed El-Hamza, said the building of $4.7bn dam near its border with Sudan violates the 1929 pact which entitled Egypt to 55.5bn cubic metres a year of the Nile's flow and the consequences would be dire for the country.

"Ethiopia should not go ahead with its plans of building this dam. The 1929 pact clearly entitled us to 55.5bn cubic metres a year of the Nile's flow of around 84bn cubic metres. Our population will suffer as a result of this dam because they almost use all the water available to the Nile," he said.

Ethiopia and five other upstream Nile states, such as Kenya and Uganda, say Egypt's claims are outdated and have signed a deal effectively stripping Cairo of its veto based on colonial-era treaties over dam projects on the river.

President Yoweri Museveni recently advised Egypt to handle the dispute over use of the waters of River Nile with caution.

"It is advisable that those chauvinistic statements coming out of Egypt are restrained and through the Nile Valley Organization rational (not emotional and informed statements) discussions take place," Museveni said while addressing the nation and parliament last month.

He added: "No African wants to hurt Egypt; however, Egypt cannot continue to hurt black Africa and the countries of the tropics of Africa."

He said the work Ethiopia is undertaking by building dams is crucial to regional economy, and should instead be encouraged by Egypt. "The biggest threat to the Nile is continued under-development in the tropics i.e. lack of electricity and lack of industrialization."

Museveni advised that industrialization is what is needed in the region so that people stop using wood fuel and shift from agriculture to industry and services.

Ethiopia's parliament last month ratified a controversial treaty ensuring its access to Nile water resources, amid bitter arguments with Egypt trigged by an Ethiopian dam project.

The deal replaces a colonial-era agreement that granted Egypt and Sudan the majority of water rights and allows upstream countries to implement irrigation and hydropower projects without first seeking Egypt's approval.

"Egypt warns Ethiopia over plans to build dam on river Nile", 27/07/2013, online at: http://www.newvision.co.ug/news/645490-egypt-warns-ethiopia-over-plans-to-build-dam-on-river-nile.html

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❖ Ethiopia: Dam Causes No Harm On Ethio-Egypt Ties

Ethiopia is keen to maintaining strong ties with Egypt and the dam under construction by Ethiopia on the Abay (Blue Nile) River will not be a source of tension in their relations, Ethiopia's Ambassador to Egypt said.

The Renaissance Dam would not affect Egypt's share of the Nile water and both countries benefit from it, Mahmoud Drir said in a recent interview with Xinhua.

"Mutual interests between the two states connect their future, and the minor issues that rise sometimes cannot affect their relations," said the Ambassador, describing ties with Egypt as "historic and eternal."

"Even the diplomatic relations between both countries date back 85 years, when most African states were under Western occupation," he added.

In May this year, Ethiopia started diverting the course of the Blue Nile, one of the Nile River's two basic tributaries, as part of a process in the construction of the most aspired Grand Renaissance Dam. The move raised concerns in Egypt over its annual share of the waters as it is one of the downstream Nile Basin countries.

Some Egyptian experts said the planned Ethiopian dam would cause harm to Egypt. Drir reassured that the dam would not inflict any harm to the Egyptian interests and the country's share of water.

"It will have a positive effect in terms of development, not a negative one as some claim," he said, noting that any project of this kind established in Africa is meant to serve African development in general.

The ambassador said studies made by international experts showed that the dam doesn't cause any significant effect adding that Ethiopia had set up a tripartite committee with Egypt and Sudan on the issue.

He criticized some Egyptian media for distorting the image of the dam and depicting Ethiopia as "a rival state" that builds a dam with Israeli finance and management. "We believe that permanent

development and real partnership between Egypt and Ethiopia will wash away such suspicions," Drir said.

"The dam could be a win-win solution," he said. "The future and destiny of both Ethiopia and Egypt are intertwined by strong, inseparable, historical bonds."

Reports say on Sunday, Egypt's newly-appointed Foreign Minister Nabil Fahmy discussed the issue with his Ethiopian counterpart Tedros Adhanom via a phone call showing his interest to holding the agreed technical consultations among Egypt, Ethiopia and Sudan to implement the committee's recommendations.

"Ethiopia: Dam Causes No Harm On Ethio-Egypt Ties", 23/07/2013, online at: http://allafrica.com/stories/201307240200.html

❖ Egypt's Nile water concerns rise

(MENAFN) Egypt has expressed its concern about non-respondent Ethiopia to an invitation to discuss a dispute over a giant dam that Ethiopia plans to build on the river Nile, Reuters reported.

Egypt fears the dam will reduce water flows vital for its 84 million people who use almost all of the Nile water available to it.

Recently ousted Egyptian President Mohamed Mursi said last month that "all options" were open in dealing with the issue, prompting Ethiopia to say it was ready to defend its USD4.7 billion dam, set to be built near its border with Sudan.

Ethiopia also summoned the Egyptian ambassador after politicians in Cairo were shown on television suggesting military action or supporting Ethiopian rebels.

Egypt cites a 1929 pact which entitled Cairo to 55.5 billion cubic metres a year of the Nile's flow of around 84 billion cubic metres.

However, Ethiopia and five other upstream Nile states, such as Kenya and Uganda, say Egypt's claims are outdated and have signed a deal effectively stripping Cairo of its veto based on colonial-era treaties over dam projects on the river.

"Egypt's Nile water concerns rise", 22/07/2013, online at: http://www.menafn.com/1093681361/Egypts-Nile-water-concerns-rise

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❖ Found: Alternatives to bottled water

TEL AVIV: The demand for bottled water keeps growing despite the industry being fuel-consuming and highly polluting. A new Israeli company believes it has an alternative to this pressing environmental problem â€" kiosks that dispense water as safe as the bottled variety without adding to the plastic menace.
Woosh is a startup that uses a patent-pending, ozone-based disinfection system at its kiosks for killing microorganisms just before the water is dispensed.

There are slots in these easily-identifiable kiosks to disinfect reusable bottles without the use of hands and multiple payment options.

"The idea is to have a network of such kiosks in a city so that people can refill their bottles on the go without worrying about contamination. Our first pilot is currently on in Tel Aviv," says Dani Oren of Woosh.

Israel has been called 'startup nation' for a culture of entrepreneurship that encourages young people to bet on new ideas. The country's water sector is a good example of this trend, with a number of tyros bringing in innovation to address a range of needs.
Like Woosh, SmarTap is a small startup that believes it's on to a big idea. SmarTap has developed a digital shower system that gives users precise control over water temperature and flow.

The company seeks to target the hotel sector with the promise of big savings on their water bills. "There are embedded controls in the system through which flow rates can be reduced for water and energy savings without spoiling the shower experience," says Ran Zarivatch, the company's business development manager.
Water-Gen has a more established presence. The startup produces water from air, among other things. These water production units, mainly designed for combat vehicles, turn out 30-60 litres per day of potable water from humidity in the air. The water is dispensed cold from a tap installed inside a tank or other military vehicles.

"Troops need water wherever they go. In Afghanistan, for instance, 50% of Nato movements take place for supplying water to troops. Our patented heat-exchange technology produces water at the

point of use, doing away with a major logistics headache," says Water-Gen CEO Arye Kohavi, himself a former soldier.

The Israel government backs such innovations by organizing a water exhibition every two years.

"Found: Alternatives to bottled water", 28/07/2013, online at: **http://articles.timesofindia.indiatimes.com/2013-07-28/environment/40848056_1_water-sector-bottled-water-water-bills**

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❖ Engineers bridge the gap between training and real life

FORT CHAFFEE, Ark – When describing the terrain and sights of the wars in Iraq and Afghanistan, the words dry, desert, snow, mountain, tank and Humvee may come to mind immediately.

It is often forgotten, however, that these countries' landscapes also consists of large water sources such as the Helmland and Kabul rivers in Afghanistan and the Tigris and Euphrates rivers' in Iraq.

With every river, stream or lake comes the obstacle of reaching the sometimes-desolate towns and areas bordering these water sources. Due to these reasons it is not uncommon for terrorists to take cover in these small towns and for the people living there to go unnoticed.

"When you're talking about war and finding the bad guys, they are not always exactly the easiest to find," said Staff Sgt. Kristopher McDonald, 671st Engineer Company (Multi Role Bridge).

To ensure that no stone is left unturned and that every citizen receives critical help and attention, there is a need to cross these large water sources. That is where units like the 671st Eng. Co. (MRB) come into play.

The Engineers provide the ability to cross these water sources by providing boats that can assist in creating four-way ramp rafts, also known as six-floats and shore to shore full-enclosure floating roadways.

McDonald's past deployments in Iraq in 2003 and 2008 required bridges being built to help sustain a presence in hard to reach areas and the ability to provide important supply to troops.

"Waterways can be a huge obstacle for the movement of our troops and their ability to complete their mission," said McDonald, a native of Monroe, Wash. "There wasn't always the option to just go around it and even if there was, sometimes it was easier and quicker to just build a bridge."

To prepare for the possibility that they will be needed overseas, the Army Reserve soldiers are partaking in Operation River Assault here from July 14 until July 24.

The operation is an exercise that combines warrior-skills training with a river-crossing mission, bridging together nearly 1,000 soldiers from a variety of Reserve and active duty units: engineers, medics, military police and dive specialists, as well as support personnel.

Specifically pertaining to the 671st Eng. Co. (MRB) engineers, it provides them the ability to test and familiarize themselves with their boats and equipment on various lakes and rivers. The exercise culminates with a large-scale wet gap crossing exercise on the Arkansas River where they will

construct a full-enclosure floating roadway.

They take opportunities like this seriously and take advantage of the ability to train on a fast water river.

“It’s not hard for us to take the boats out for a day and train on the lake at Fort Lewis,” said McDonald, whose unit’s are housed in Clackamas, Ore., and Marysville, Wash. “But to get out on an actual river with (realistic) scenery and typical landscape features can be hard to come by.”

“So we look forward to being able to hone our skills here at Operation River Assault and want to be able to leave here saying we did our very best and didn’t waste the opportunity,” added McDonald.

Even with a presence in Iraq and Afghanistan diminishing, Spc. Josef Bennett believes the training is critical in keeping the Soldiers on their toes for future deployments, wherever it may take them. Bennett is currently serving as an engineer with the 671st Eng. Co. (MRB).

“No matter where you are in this world, there is always going to be water,” said Bennett, a native of Salem, Ore. “This world is a crazy place, so you never know where you might be headed. For those reasons we take every opportunity to get better and ensure we are ready at the flip of a switch.”

“Engineers bridge the gap between training and real life”, 21/07/2013, online at : http://www.dvidshub.net/news/110559/engineers-bridge-gap-between-training-and-real-life#.UfKVI9JPiok

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❖ Foreign ministers promote 'water diplomacy

EU foreign ministers underscored on Monday (22 July) that tensions over access to water are likely to rise in the next decade and could endanger stability in many parts of the world. They also highlighted the potential of "water diplomacy" and the need to promote cooperation based on EU experience.

Water security was brought to the table by a decision taken earlier that the ministers should periodically look into long-term issues of high importance. No specific water-related conflict was discussed at the Brussels meeting.

As the ministerial agenda was packed with issues that included putting Hezbollah on the EU terrorist list and the Middle East peace process, no discussion took place on water diplomacy.

A diplomatic source told EurActiv that the ministers endorsed Council Conclusionsprepared ahead of the meeting.

Ministers acknowledge that water-related conflicts could endanger the stability in many parts of the world, affecting the EU interests and international peace and security. Climate change and demographic developments are seen as aggravating the situation.

Some 783 million people, or 11% of the world's population, lack access to improved sources of drinking water, UN figures show.

Ministers stress that water and sanitation should be taken into account in designing the successor to the Millennium Development Goals (MDGs), which expire in 2015. They also highlight the need to empower women, as well as civil society and local communities - giving them a stronger voice in water diplomacy.

Ministers also welcomed the result of the EU Water Security Mapping Initiative, which they said has provided a picture of the individual member countries' engagement on transboundary water security challenges across the world.

The Nile basin, the Middle East, the Sahel region, the Mekong River and Central Asia are among the areas of concern. The ministers called on EU foreign affairs chief Catherine Ashton to continue to work with the countries concerned to broker solutions.

The United Nations Educational, Scientific and Cultural Organization says the current interstate conflicts over water resources occur mainly in the Middle East (disputes stemming from the Euphrates and Tigris Rivers among Turkey, Syria, and Iraq; and the Jordan River conflict among Israel, Lebanon, Jordan and the Palestinians), in Africa (Nile River-related disagreements among Egypt, Ethiopia and Sudan), as well as in Central Asia (the Aral Sea disputes among Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan and Kyrgyzstan).

Ministers also emphasised that EU policy promoting water cooperation across the world could be built based on the long experience and knowledge of the management of transboundary waters in Europe.

"Foreign ministers promote 'water diplomacy", 23/07/2013, online at: http://www.euractiv.com/development-policy/eu-ministers-promote-water-diplo-news-529506

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❖ EU Ministers Warn of Growing Water Tensions Around the World

During a meeting in Brussels this week, European Union foreign ministers discussed the possibility of increased tensions over lack of access to water that could lead to instability in many regions of the world in the next 10 years.The ministers also promoted "water diplomacy" and cooperation based on the EU experience as a way to avoid future conflict. Many parts of the world are at risk of instability due to lack of water resources, and this in turn could affect EU interests and international peace, according to the ministers.

Climate change and demographic developments can only aggravate the situation, they added. They called for water and sanitation to be main factors in the design of the development goals that will replace the UN Millennium Development Goals (MDGs), which end in 2015.

Empowering women, civil society and local communities will lend to better water diplomacy, they stressed. The regions facing the greatest threat of water-related conflict and insecurity are the Nile Basin, the Middle East, the Sahel region, the Mekong River basin and Central Asia.

Many of these regions are already showing signs of water-related conflict. Egypt has recently threatened action against Ethiopia if that country's Grand Renaissance Dam reduces any of the Nile flows into Egypt. Egypt considers the loss of water an attack on its security. However, the two nations have been holding diplomatic meetings in an attempt to reach an agreement.

Mekong River basin states are currently disputing large dams along the main stem of the river, with Laos deciding to begin construction on the controversial Xaraburi Dam without complete downstream approval. Laos has plans for another 10 dams, which is causing increased concern about livelihoods of people living in the delta.

In Central Asia, upriver nations are using the region's major rivers for hydropower production, while downriver nations need the water for irrigation. The two sides have most recently clashed over Tajikistan's plans to construct the mega Rogun hydropower dam; Uzbekistan has even threatened war over the possible loss of water.

As for the Middle East, there are examples of both water-related conflicts and water diplomacy. Israel, Lebanon, Jordan and the Palestinians dispute Jordan River sharing, while Turkey, Syria and Iraq have disagreed over sharing the Tigris and Euphrates Rivers. However, the Gulf Cooperation Council is currently developing a joint water network.

The EU ministers stressed that the long experience and knowledge gathered from shared management of trans-boundary waters in Europe could help the rest of the world improve cooperation.

"EU Ministers Warn of Growing Water Tensions Around the World", 24/07/2013, online at: http://www.ooskanews.com/story/2013/07/eu-ministers-warn-growing-water-tensions-around-world_156916

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❖ Pakistan's Balochistan plans to sign power deal with Iran

Authorities in Pakistan's southwestern province of Balochistan are planning a deal to import electricity from the neighboring Iran to overcome severe energy crisis which has affected agriculture in the province.

In a meeting with Pakistani Minister of Water and Power Khawaja Muhammad Asif in Islamabad on Tuesday, Chief Minister of Balochistan Abdul Malik Baloch highlighted the need for the import of 1,000 megawatts (MW) of electricity from Iran to meet part of the 1,600-MW energy demand in Pakistan's largest province.

He further noted that Balochistan only receives 700 MW of electricity from Pakistan's national electricity grid.

Pakistan is battling chronic electricity shortage, which is inflaming public anger and stifling industrial output, as power outages can last eight to 10 hours a day in cities, with much more frequent cuts in rural areas.

"Pakistan is an energy-starved country facing severe power cuts that are badly hampering industrial output," Pakistani Commerce Ministry spokesman, Mohammad Ashraf, said, adding, "Connecting far-flung areas to Pakistan's grid is a costly affair."

Electricity imports from Iran reportedly cost Pakistan around USD 3 million a month. Electricity is supplied to towns near the Iranian border, including Gwadar port.

Pakistan now owes Iran USD 53 million for the electricity imports but its cash-strapped government and private power companies have no means to pay, as the companies' infrastructures are outdated and the utilities are inefficient.

Pakistan's electricity is generated, transmitted, distributed, and sold by two vertically integrated public sector utilities - Water and Power Development Authority, responsible for all of Pakistan except Karachi, and the Karachi Electric Supply Corp - along with roughly 20 independent power producers. None have developed substantive solutions to the country's ongoing power crisis.

"Pakistan's Balochistan plans to sign power deal with Iran", 24/07/2013, online at: http://tehrantimes.com/economy-and-business/109557-pakistans-balochistan-plans-to-sign-power-deal-with-iran

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❖ Pakistan is world's most water-stressed nation

According to a Tuesday **report** by ThinkProgress, Pakistan's water demand has long exceeded its supply.

A recent Pew poll **shows** that the majority of international regions rate international financial stability and climate change above Islamic extremist groups as the biggest global threats to security, economic stability and well-being. Pakistan is the epitome of an agriculturally-based country battling the scarcity of its most vital resource — water.

For close to a decade, the lack of rainfall has**caused** Pakistan to dangerously deplete reservoirs and groundwater supplies, which has now plunged the country a water crisis. As rainfall averages have fallen shorter every year, the population has increased.

The Atlantic recently published an article that**notes** many challenges facing Pakistan as its population is projected to reach 256 million residents by 2030. Now it can barely provide water to its current population of 180 million.

According to a recent **report** by the Asian Development Bank (ADB), 80 percent of Pakistan's farms are irrigated with water drawn from rivers and reservoirs, but methods are so inefficient the report estimates crop yields would double if proper management and reforms were implemented.

Climate change and lack of rain is reducing water flow in the Indus River, which is the main source of fresh water in Pakistan. The country faces threats of protests in the streets because people have so little water for their daily needs. During the hottest months of the year, Abbottabad had more than 5,000 homes without sufficient water supplies. Parties and politicians, pointing fingers at each other, have been unable to provide a solution.

From the ADB's **report**:

Water demand exceeds supply, which has caused maximum withdrawal from reservoirs. At present, Pakistan's storage capacity is limited to a 30-day supply, well below the recommended 1,000 days for countries with a similar climate. Climate change is affecting snowmelt and reducing flows into the Indus River, the main supply source. Increases in storage capacity to manage periods of low

snowmelt and low rainfall are required, as well as the rehabilitation of the distribution system to reduce losses.

Adding to the problem, militant Pakistani groups have accused India of "water terrorism," due to India's activity of building several dams on the Indus River upstream from Pakistan on the India side of the territory. As a result, Pakistan wants to renegotiate the 1960 Indus Water Treaty, which governs how water is divided from the six rivers in the Indus basin.

ADB reports that India is reluctant to amend the treaty arrangement, which would likely require changes in pricing and water-flow management.

However, a recent **agreement** between the Karachi Water and Sewer Board and the China International Water and Electric Corporation may offer a sliver of hope. The goal of the agreement is to make "Pakistani city's water supply self-sufficient."

But the plan could take years to implement.

Meanwhile, the **drought** continues, reservoirs shrink, snow packs decline and people watch their crops wither in the fields, while they walk for miles to retrieve a few buckets of drinking water.

It's been said that water will become more precious than oil. Pakistan is rapidly becoming symbolic of that prophecy as the demand for water continues to exceed the country's supply.

"Pakistan is world's most water-stressed nation", 24/07/2013, online at: http://www.examiner.com/article/pakistan-is-world-s-most-water-stressed-nation

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❖ Bangalore Faces Water Crisis

Bangalore [1], India's third largest city and one of the fastest growing economic hubs in South Asia, stares at an almost certain water crisis in the near future as both the civic administration and the citizens struggle to cope with the already dwindling fresh water resources.

Home to more than 9.5 million people [2] and rapidly adding migrants to this number who come every day to this city to find their dream job, Bangalore is fighting to cope with the increasing demands of its population. The most important demand remains for fresh water.

In a recently concluded discussion on Bangalore's water crisis, local administrative board Bangalore Water Supply and Sewage Treatment Board, Chairman Gaurav Gupta claimed [3]:

If you are taking a property in Bengaluru, especially in the peripheral areas, take at your own risk! We really don't have water for those areas.

has 189 live lakes. The rest of the lakes are either carelessly encroached upon or have severe contamination by sewage water.

Bangalore has doubled its population [6] since 2001 and mindless planning of infrastructure has led to depletion and contamination of ground water. The Bangalore Water Supply and Sewerage Board, which was so far drawing 1.15 billion litres of water per day [7] through all the four stages of the Cauvery, is now drawing only 800 million litres per day taking the shortage to 350 litres per day.

This contaminated water was found to have at least four strains of bacteria [8] which can cause severe intestinal infections. Where does this water end up? It seeps through the lake bed into the city's underground water, which is pumped into the city's households by bore wells. A shocking study [9] by Eureka Forbes Limited, Mumbai

claims that the people of Bangalore are immune to some strains of these bacteria as they have been drinking this water for more than ten years now.

It's not just contamination, Bangalore is the fastest growing real estate market in the country, and this translates to large apartments, villas, and bungalows in all parts of the city. Since the landscape is dotted by concrete structures, the rain water runs off into drains without seeping through the soil, thereby severely depleting the underground water resources. What's worse is that the construction of elevated expressways and the Bangalore Metro Rail has rapidly depleted Bangalore's green cover, effecting rainfall adversely.

The causes for this acute shortage are highlighted in Goutham Sampath's [10] blog "Bangalore Realty":

Bangalore was free of air-conditioned malls and multiplexes, but shopping and entertainment options were still plentiful. Bangalore was free of its Information Technology tag, but was still a reasonably significant industrial manufacturing hub. With its tree-lined roads, large open spaces and now abundant Cauvery water, Bangalore was really the Pensioner's Paradise, where retired folks could live without any worries.

Ritwik Kaikini, an engineering student from south Bangalore, told Global Voices how even the trucks used to transport fresh water are faulty: "There is leakage in almost all the water trucks, always. Half the water leaks away till they reach the destination and this is just criminal wastage of water".

Purushotham Daldur, a student and a resident of the same area, said, "I feel even the pipes used to transport fresh water are faulty."

Ananth Narayan S [11] wrote in his blog how even the most perennial sources of water in Bangalore are running dry:

With an extremely poor monsoon in the previous year, most lakes had dried up. What was surprising however was that the only perennial water body in Bangalore – the sewer lines – had also dried up. The citizens and the Bangalore municipal corporation (BBMP) are at a loss on how to handle the situation. The BBMP said "We have water treatment plants in the city. Those used to satisfy a small portion of the city's water needs. Now even that is lost. We are not sure how to handle the situation; for now an ad hoc committee has been constituted".

This problem is being faced by Pune, Hyderabad, and other growing cities too, as Sainath P [12] in newspaper the Hindu reported:

Every apartment is a dream come true — the coronet that tops the king-sized lifestyle of true blue blood. So run the ads. Yup, the blue bloods do it big. Each apartment has its own private swimming pool. These are, after all, super-luxurious, supersized designer apartments. The kind that match the royal lifestyles.

It seems the thousands of skyscrapers in India's big cities are luxuriously using fresh water to fill-up the pools of the super-rich but on the other hand, the middle class and the poor reel under what is one of Bangalore's worst civic problems in centuries.

At a time when the city of Bangalore is reeling under an acute water crisis, more than 150 volunteers of the Art of Living Foundation in Bangalore along with founder Sri Sri Ravi Shankar led a walkathon with posters on how to save water in July 2013.

The spiritual guru told NDTV [13], a national news channel:

Water is such a scarce thing now and we must do all we can to judiciously use it. Our volunteers are trying to prevent one of the small rivers, the Kumudvathi in Bangalore from drying up. They are planting trees in the area which can help prevent soil erosion, building boulder checks. Anything which can help rejuvenate and revive our natural resources must be done, today and now.

Among all the negative information come a few rays of hope when citizens take it upon themselves to save water and check water wastage by doing common things around the house and offices.

Another story that offers a glimmer of hope [14] is that of A.R. Shivakumar, a senior fellow of Karnataka State Council for Science and Technology, Indian Institute of Science, Bangalore. Shivkumar, who is nicknamed as Bangalore's rain catcher, says that to meet the Bangalore's high water consumption (1.4 billion litres per day or 18 billion cubic feet) rain water harvesting is the answer.

While the authorities have made it mandatory for all houses in Bangalore larger than 2,400 square feet to harvest rain water, many have avoided the trouble of installing a rain water harvest system. The local authorities must swing into action in order to ensure this ingenious solution is implanted at a time of a crisis like this one.

How Bangalore tackles this issue is going to be critical, as the same model can be used to solve the water crisis in other cities which are on the verge of urbanization. What is needed now is swift action by the civic authorities and a united front by the citizens to help preserve what little water is available.

"Bangalore Faces Water Crisis", 26/07/2013, online at: http://groundreport.com/bangalore-faces-water-crisis/

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❖ China Coal-Fired Economy Dying of Thirst as Mines Lack Water

At first glance, Daliuta in northern China appears to have a river running through it. A closer look reveals the stretch of water in the center is a pond, dammed at both ends. Beyond the barriers, the Wulanmulun's bed is dry.

Daliuta in Shaanxi province sits on top of the world's biggest underground coal mine, which requires millions of liters of water a day for extracting, washing and processing the fuel. The town is the epicenter of a looming collision between China's increasingly scarce supplies of water and its plan to power economic growth with coal.

"Water shortages will severely limit thermal power capacity additions," said Charles Yonts, head of sustainable research at brokerage CLSA Asia-Pacific Markets in Hong Kong. "You can't reconcile targets for coal production in, say, Shanxi province and Inner Mongolia with their water targets."

Coal industries and power stations use as much as 17 percent of China's water, and almost all of the collieries are in the vast energy basin in the north that is also one of the country's driest regions. By 2020 the government plans to boost coal-fired power by twice the total generating capacity of India.

About half of China's rivers have dried up since 1990 and those that remain are mostly contaminated. Without enough water, coal can't be mined, new power stations can't run and the economy can't grow. At least 80 percent of the nation's coal comes from regions where the United Nations says water supplies are either "stressed" or in "absolute scarcity."

Desert State

China has about 1,730 cubic meters of fresh water per person, close to the 1,700 cubic meter-level the UN deems "stressed." The situation is worse in the north, where half China's people, most of its coal and only 20 percent of its water are located.

Shanxi -- the nation's biggest coal base, with about 28 percent of production -- has per capita water resources of 347 cubic meters, less than the Middle Eastern nation of Oman. Inner Mongolia and Shaanxi, which together contribute 40 percent of coal output, have less than 1,700 cubic meters per person.

A government plan to boost the coal industry and build more power plants near mines will lift industrial demand for water in Inner Mongolia 141 percent by 2015 from 2010, causing aquifers to dry up and deserts to expand, according to Greenpeace and the Chinese Academy of Sciences'

Institute of Geographical Sciences and Natural Resources. About 28,000 rivers have vanished since 1990, according to the Ministry of Water Resources and National Bureau of Statistics.

Ordos Wells

"After five years there won't be enough water in Ordos in Inner Mongolia," said Sun Qingwei, director of the climate and energy campaign at Greenpeace in Beijing. "The mines are stealing ground water from agriculture. Local governments want their economies to boom."

Wells drilled near Haolebaoji near Ordos by Shenhua Group, the world's biggest coal producer, have caused groundwater levels to drop to a depth of as much as 100 meters, drying out the region's artesian wells, Greenpeace said in a report yesterday. Two calls to Shenhua weren't answered.

The water that does exist is mostly polluted. A government survey published in February shows that only about a quarter of the groundwater in the North China Plain -- an area that's bigger than Greece and includes Beijing and Tianjin, the province of Hebei and parts of Henan and Shandong -- is fit for human consumption.

Severe Pollution

Severe water pollution affects 75 percent of China's rivers and lakes and 28 percent are unsuitable even for agricultural use, according to the 2012 book "China's Environmental Challenges," by Judith Shapiro, director of the Masters program in Natural Resources and Sustainable Development at the School of International Service at American University inWashington.

Geneva-based Pictet Asset Management's $3.17 billion globalwater fund doubled its exposure to stocks offering water services in China to 10 percent since 2007. For Zurich-based RobecoSAM's 611 million-euro Sustainable Water fund, "emerging markets offers the best opportunities in the world for water investments and China is the standout."

Water-treatment companies Beijing Enterprises Water Group Ltd. (371) and China Everbright (165) International Ltd., which Pictet invested in in 2009, are among its best performers this year, partly on prospects for stricter environmental regulation in China, said Geneva-based portfolio manager Arnaud Bisschop.

Beijing Enterprises has risen 55 percent this year to HK$3.10 and Deutsche Bank sees it reaching HK$3.20 within a year. China Everbright is up 83 percent to HK$7.18 and JPMorgan Chase & Co. estimates it will reach HK$7.60 by mid-October.

'Utmost Urgency'

"The best opportunity is in industrial water re-use, and for the mining industry, it is of the utmost urgency," said Junwei Hafner-Cai, a manager of RobecoSAM's Sustainable Water fund. "Water that has been released from the coal mines and from petrochemical plants has resulted in severe pollution on top of the water scarcity."

A shortage of coal because of the lack of water to mine and process the fuel may force China to increase imports, pushing up world prices, according to Debra Tan, director at research firm China Water Risk in Hong Kong. China, which mines 45 percent of the world's coal, may adopt an aggressive "coal-mine grab" to secure supplies, said Tan.

Chinese demand will account for 25 percent of global coal imports by 2015, London-based shipbroker ACM Shipping Group Plc said in a report in April. Indonesia is the largest overseas supplier of power-station coal to China, which buys as much as 45 percent of the Southeast Asian nation's exports of the fuel.

China is responding with harsher limits on water usage, a new tariff structure that allows for steep price gains, and plans to spend 4 trillion yuan ($652 billion) by 2020 to boost water infrastructure and resources.

Water Caps

Caps introduced in January limit the annual increase of water used by the four biggest coal-producing regions to 2.9 percent annually until 2015, while their combined coal output is set to increase almost 5 percent a year, according to CLSA.

Water shortages mean "industrial plants are more and more under pressure," said Guillaume Dourdin, Beijing-based head of the North-West China region for France's Veolia Water, which treated 1.2 billion tons of waste water in China last year. "In some places we can see it is a constraint for industry. We don't see a water war in China but obviously there are some tensions on the resource in some parts." Veolia Water, a unit of Veolia Environnement SA (VIE), Europe's biggest water company, has more than 13,000 employees in China.

Truck Queue

In Daliuta, the mine is "sucking up the groundwater," said Sun at Greenpeace. Trains hundreds of cars long rumble along elevated tracks through the town center, hauling coal. On the highway to

Yulin, trucks carrying the fuel queue nose-to-tail for more than five kilometers to pass through toll booths.

Daliuta's coal output surged 26 percent last year to 29.4 billion tons, according to owner China Shenhua Energy Co. (1088), the nation's biggest coal producer.

The town's river-turned-pond was dammed about six years ago to beautify the area for new apartment blocks along the banks, said Zhe Mancang, who owns a liquor store nearby. The artificial lake is now contaminated with waste water from the mines.

"I worry about the water," said Zhe, 58. "But I've no choice. My family's here and my customers are from the mines."

The effect of water shortages extends beyond the north. New rules this year require the manufacturing hubs of Jiangsu and Guangdong provinces and Shanghai to reduce water use every year even as their economies expand. Nationwide growth in usage is capped at 1 percent annually.

Water Prices

In the city of Guangzhou water prices rose 50 percent for residents and 89 percent for industrial users in May 2012 to help pay for improvements to quality and supply, according to an April report by Goldman Sachs Group Inc.

Stricter controls will raise the risk of investment in water-intensive industries and heavy polluters including coal, metals and paper production, especially in the north, said Tan.

"In an absolute worst case you'd see a large-scale shift in economic activity and population further south for lack of water, and manufacturing increasingly moving abroad," said Scott Moore, a research fellow at the Harvard Kennedy School's Sustainability Science Program in Cambridge, Massachusetts.

To alleviate the shortage in the north, the central government in 2002 approved the 500 billion yuan South-to-North water diversion project, the largest irrigation project in the world. The plan is to carry 44.8 billion cubic meters of water from the Yangtze river along three routes.

Tianjin Canal

The 1,467-kilometer-long eastern canal to Tianjin is scheduled for completion at the end of this year. The central route to Beijing, more than 1,270 kilometers, is slated to open next year. The western route is still being planned.

Even this massive program may not be enough. The Asian Development Bank said in a report last year that China's demand for water may exceed supply by as much as 200 billion cubic meters by 2030, according to some estimates, unless "major capital investments to strengthen water supplies are made beyond those presently planned."

More efficient use would help. Chinese industry uses four to 10 times more water per unit of production than the average in developed countries, Tan wrote in a February report. Only 40 percent of industrial water is recycled, compared with 75 percent to 85 percent in developed countries, the World Bank says.

Yellow River

China has had some success. In the late 1990s, so much water was being taken from the Yellow River, the nation's second-longest waterway, that it dried up before reaching the sea for as much as 226 days consecutively. After quotas controlled by electronic sluice gates were implemented, the amount of water needed to generate 10,000 yuan of GDP fell to 308 cubic meters in 2006, from 1,672 cubic meters in 1990, according to the Yellow River Conservancy Commission.

China's efforts to expand alternative energy, including investing $65.1 billion in clean energies like solar and wind power in 2012, aren't enough to match rising demand. The nation's dependence on thermal power generation, including gas and oil, will decline by just three percentage points to 76 percent by 2030, Bloomberg New Energy Finance analysts Maxime Serrano Bardisa and Alasdair Wilson wrote in a February report.

Among the biggest losers are farmers, who have to dig deeper and deeper wells to find clean water, or are forced out by local governments who see bigger economic gains from mining.

In Zhanggaijie village, 90 minutes from Yulin city in Shaanxi, Li Qiaoling's corn harvest slumped to 2 to 3 tons per mu (667 square meters) from 4 to 5 tons four years ago, she said. Li, 43, had to deepen her well to 60 meters from about 30 meters five years ago, she said.

Relocation Wait

Now she waits with about 200 villagers for compensation and news from local officials on where they will be relocated after coal mining polluted the local water supply, said Li.

"We're angry because we have to leave," said Li, who still farms and sells produce from her 11 mu plot, despite the contamination. "We're worried about moving to a strange place."

Premier Li Keqiang vowed at a March press briefing to crack down on pollution. "Being rich and well-off isn't OK either if the environment deteriorates," Li said.

Implementing such promises has proved elusive. In April, a group of 60 officials from the Ministry of Environmental Protection told Zhang Haibin, an associate professor at Peking University, that they "don't dare to really monitor" pollution because it would affect growth, Zhang said at a forum. The officials said when "economic growth conflicts, environmental targets always give way," Zhang said.

A manufacturing report today from HSBC Holdings Plc and Markit Economics only highlighted that pressure, pointing to a deeper slowdown this month in the Chinese economy.

"China Coal-Fired Economy Dying of Thirst as Mines Lack Water", 24/07/2013, online at: http://www.bloomberg.com/news/2013-07-23/china-s-coal-fired-economy-dying-of-thirst-as-mines-lack-water.html?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=cd44c8c995-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-cd44c8c995-250657169

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❖ Durban Municipality's Water Project Includes Salt Sales

Ilembe, the fastest-growing area on the east coast of South Africa, has embarked on a pilot project to increase water supplies that features selling salt extracted from a desalination plant and a shrimp-breeding farm.

The municipality of 560,000 residents north of Durban has approved a desalination plant that will supply as much as a half-million liters (132,000 gallons) of fresh water a day, recycling the salt for commercial sale. Wind turbines may be used to save on power bills.

The $6.1 million project was initiated because South Africa's eastern coast has such a low water table that boreholes are usually unfeasible with short, fast-flowing seasonal rivers that affect the reliability of water and a dispersed rural population that makes infrastructure expensive.

Ilembe like much of the nation is looking for a long-term, self-sustaining water solution. Treasury's 2012 Budget Review says South Africa will start running out of water 13 years from now without better management. On current projections, South Africa's water demand will outstrip available supply by 2025 to 2030, according to the document.

"We have a 35-year master plan for water," Ilembe Municipal Manager Mike Newton said in an interview. With a rate of growth of 5.7 percent, a 70 percent rural population, climate change and proximity to the sea, desalination is "an attractive emergency backup in case we run out."

Using technology already in place in the Southern Cape, the project will build a portable desalination plant at Blythedale, a resort north of Durban.

Desalination Plans

It will combine techniques to create a blueprint for two larger proposed desalination plants on the north and south coasts of KwaZulu-Natal to provide water for the province.

The supply will be drawn from the dunes via a borehole instead of the sea from waters already partly desalinated.

With reverse-osmosis being used in the project, the potable supply will be remineralized as desalinated water is acidic.

Phase one of the project will cost 11 million South African rand ($1.1 million) including specialized equipment, with the second phase commercializing the salt. Part of the brine would be supplied to aquaculturalists to breed saltwater shrimp, and the rest would be dried for sale.

A projected output is a ton of salt per day. The saltwater shrimp project is already linked up with the Ocean Basket chain of seafood restaurants, which started an aquaculture company, and it's envisaged that the salt-drying project will be done in conjunction with community projects.

Phase three is to find alternative energy supplies for the plant using vertical-axis wind-turbinesor hydrogen separation. The goal is to make each plant self-sustaining.

All three phases will cost 60 million rand, amortized by selling water over the 30-year lifespan of the plant.

This desalination project is an experimental prototype for two larger planned desalination plants for KZN, one for the North Coast and another for the South Coast.

"Durban Municipality's Water Project Includes Salt Sales", 24/07/2013, online at: http://www.bloomberg.com/news/2013-07-24/durban-municipality-s-water-project-includes-salt-sales.html?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=cd44c8c995-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-cd44c8c995-250657169

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❖ Many regions of China affected by heavy rains

BEIJING, July 22 (Xinhuanet) -- Many parts of China have seen very heavy rainfall in the past few days.

Rain-triggered floods in Hunchun city in northeastern province Jilin destroyed a bridge connnecting to a neighboring town. Local government is dispatching construction machines to move people to safer places.

In Kunming, capital city of southwest China's Yunnan province, continuous heavy rains disrupted transportation. A lack of flood control systems have turned the city's south into a water-logged zone.

China's national meteorological center predicts more heavy rains will move across the country in the next three days.

"Many regions of China affected by heavy rains", 22/07/2013, online at: http://news.xinhuanet.com/english/video/2013-07/22/c_132561893.htm?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=cc668a700b-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-cc668a700b-250657169

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❖ India to Boost Spending Seven-Fold to Map Water Aquifers

India, the second-most populous nation, will boost spending to map underground water resources more than seven-fold to 33 billion rupees ($552 million) as the overuse of wells depletes aquifers, an official said.

"This increase in spending is unheard of," Sushil Gupta, chairman of Central Ground Water Board, said today in New Delhi. "But it was required. Now we need to shift our focus on not just development but also management." India spent 4.5 billion rupees in the five years ended April 2012 on groundwater in comparison, he said.

Mapping aquifers, or underground reservoirs, is expected to help India better manage crop usage and ensure drinking water for its population. The water board plans to raise the scale of geographic area to be mapped from 1:250,000 to 1:50,000 for more accurate readings, Gupta said. Data will be made available publicly for farmers to improve water-resource management and for companies' planning strategies, he said.

At least 85 percent of India's villages and half of its cities rely on wells for water. Farming accounts for about 90 percent of water withdrawals in India, with irrigated acreage almost tripling since 1950. The government's goal is to avert a water crisis in a country where agriculture accounts for 20 percent of the $1.9 trillion economy, Mihir Shah, member of the Planning Commission that sets five-year targets for economic growth, said last year.

Groundwater Loss

India lost groundwater supplies equal to more than twice the capacity of Lake Mead, the biggest U.S. reservoir located in Nevada and Arizona, because of indiscriminate use from 2002-2008, according to a U.S. National Aeronautical and Space Agency study.

Gupta also heads the Central Ground Water Authority established by India's government to regulate pumping from aquifers. Groundwater hasn't been developed evenly across India, and exploitation has led to a drop in water levels and seawater intrusion in some areas, according to the Ministry of Water Resources. Of 5,723 sites assessed, it said 839 are "over-exploited," 226 "critical" and 550 "semi-critical."

"India to Boost Spending Seven-Fold to Map Water Aquifers", 23/07/2013, online at:
http://www.bloomberg.com/news/2013-07-23/india-to-boost-spending-seven-fold-to-map-water-aquifers.html?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=018d3d01bf-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-018d3d01bf-250657169

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❖ Pakistan's New Big Threat Isn't Terrorism—It's Water

Shortages of the precious resource threaten to destabilize the region even further

In a report released last week by the Asian Development Bank (ADB), Pakistan was pinpointed as "one of the most water-stressed countries in the world, not far from being classified, 'water-scarce'." As water demand exceeds supply in the South Asian country, more and more water is being withdrawn from the nation's reservoirs, leaving them in a critically precarious position. According to the ADB, Pakistan's storage capacity, the amount of water it has on reserve in case of an emergency, is limited to a 30-day supply -- far below the recommended 1,000 days for countries with similar climates. Without meaningful action, a water crisis could push the country into further chaos.

Consider what a water shortage means for Pakistan. The last several years have seen the country plagued by chronic energy scarcities. Power outages lasting up to 18 hours a day are routine throughout the country, and they have had damaging effects on the economy and on the wellbeing of Pakistanis. Citizens frequently take to the streets, demanding a solution from their government in protests that often turn violent, worsening an already tumultuous political environment. Deficiencies of another precious natural resource, such as water, have the potential to intensify the already unstable situation in the country.

Early signs of the potential imbroglio that could transpire are already beginning to take shape. Late last week, residents in Abbottabad vowed to hold mass demonstrations if the local government was unable to address rampant water shortages in the city. The city has lacked sufficient water for the past month, with over 5,000 homes impacted in the hottest months of the year.

At a conference organized around water shortages in the province of Sindh earlier this month, leaders of political parties and various trade organizations blamed a wide array of individuals, including former Pakistani heads of state, other provinces in the country, and even Pakistan's neighbors, for the nation's water woes.

Extremist groups, of which there is no dearth in Pakistan, have also weighed in on the matter, using it as an opportunity to garner support for their movement. Hafiz Saeed, the founded of the militant group, Lakshar-e-Taiba -- the organization behind the 2008 Mumbai attacks -- has unequivocally

blamed India for Pakistan's water crunch, accusing its government of committing "water terrorism." By evoking an issue that is sensitive to millions of Pakistanis, Saeed's rhetoric demonstrates the potential of militant groups to exploit this issue.

The country's demographics make it seem as though this trend will only worsen over time. Pakistan's population has grown exponentially over the past several decades. With two-thirds of the population currently under the age of 30, the nation of 180 million is expected to swell to 256 million by the year 2030, and demand for water will only grow. Meanwhile, climate change, which has reduced water flows into the Indus River, Pakistan's main supply source, will continue to shrink the available water supply.

The response to any crisis is likely to play out, in part, through Pakistan's foreign policy. For starters, the government has been pushing to redefine the terms of the Indus Water Treaty of 1960 -- the water-sharing plan struck between India and Pakistan that outlines how the six rivers of the Indus basin would be shared. Pakistan has recently contested the construction of Indian dams on rivers that begin in India but flow into Pakistan, arguing that the dams would restrict Pakistani supply.

The dispute, which is currently being reviewed by the International Court of Arbitration in The Hague, will clearly impact the relationship between the two historic rivals, as water demand increases in both countries. But with pressure mounting from various groups within Pakistan, and the likelihood of instability increasing due to shortages, the Pakistani government may find itself in a difficult position when negotiating with India -- it will have limited bargaining room against an Indian government that may be reluctant to renegotiate a treaty that has been in place for 53 years.

There are other ways, outside of India, for Pakistan to alleviate the problem. Requiring and enforcing updated, modern farming techniques is a start. Pakistan's agriculture industry is notorious for its inefficient irrigation and drainage processes, which have contributed to the scarcity. The government will also need to reach out beyond its borders to create solutions. The Memorandum of Understanding between the Karachi Water and Sewage board and the China International Water and Electric Corporation, which strives to make Karachi self-sufficient in water supply, is one example of how deliberate international efforts can help the situation.

Water deficiency, and how Pakistan responds to it, has the propensity to shape the country significantly over the next several years and decades. Without any meaningful action, the future looks alarming. A growing population without the resources it needs to survive, let alone thrive economically, will throw the country into a period of instability that may be far worse than anything we see today.

"Pakistan's New Big Threat Isn't Terrorism—It's Water", 19/07/2013, online at: http://www.theatlantic.com/international/archive/2013/07/pakistans-new-big-threat-isnt-terrorism-its-water/277970/?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&&utm_term=0_c1265b6ed7-018d3d01bf-250657169

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❖ Leaving Our Descendants A Whopping Rise in Sea Levels

German scientist Anders Levermann and his colleagues have released research that warns of major sea level increases far into the future. In an interview with Yale Environment 360, he raises important questions about how much we really care about the world we will leave to those who come after us.

BY FEN MONTAİGNE

Last week, a group of scientists led by Anders Levermann of the Potsdam Institute for Climate Change Research released a paper that made a stark forecast: For every 1 degree Celsius of temperature increase, the world will eventually experience a 2.3-meter increase in sea level. That means that should carbon emissions continue to rise at or near current rates, and temperatures soar 4 to 5 degrees C in the next century or two, the world could well experience sea level increases of many meters — dozens of feet — in the centuries and millennia to come.

Levermann is a scientist, not an ethicist — he is lead author of the sea level chapter in the upcoming fifth report of the Intergovernmental Panel on Climate Change — but he is acutely aware of the import of his research for future generations. In an interview with *Yale Environment 360* senior editor Fen Montaigne, Levermann discusses how he and his colleagues reached their conclusions, how much disruption such large sea level increases might cause, and why we need to ponder the effect of our actions on future generations. "Society needs to decide about how much damage it wants to do in the future and how much damage future generations can actually cope with," he says.

Yale Environment 360: What are the main points that you think readers should take away from this paper?

Anders Levermann: The real new thing is we have asked the question not how much sea level rise will there be in 2100, but rather how much sea level rise are we already committed to at a certain level of global warming? And these numbers are much higher than the numbers we expect in 2100.

Sea level is like a big ball — it takes a while until you get it rolling, but once it's rolling you can't stop it easily. The projections by 2100 are significantly below 2 meters [6.6 feet] of global sea level rise. But we expect over a period of 2,000 years a sea level rise of 2 meters for each degree Celsius of warming. Now if you look at the projections for temperature by 2100, a business-as-usual scenario in which we increase the CO2 emissions every year like we have done in the past would lead to a warming of about 4 to 5 degrees Celsius [7 to 9 degrees F]. And long-term, 4 to 5 degrees in our study translates to something in the vicinity of 9 meters [29.6 feet] of sea level rise. So it's less than 2 meters sea level rise projected for 2100, but in the long term it's 9 meters.

e360: So you're saying once this warming is in the atmosphere, it's going to take a while for the melting of various ice sheets and the thermal expansion of water to catch up to it?

Levermann: What I'm saying is once you put a certain amount of CO2 in the atmosphere, you'll have to live with the corresponding warming for a long time. This is a problem we look into with respect to sea level rise because this long-term warming results in a long-term sea level rise that will not stop in 2100, but will go on and on for a long time.

e360: Could you discuss your confidence in your findings and what measurements and models you used to make sure that the numbers you came up with represent a pretty reasonable forecast.

Levermann: What we have done is we take the state of the art physical models for each component that is relevant for sea level rise — the thermal expansion of the ocean, melting of [mountain] glaciers, and melting of the

Greenland and Antarctic ice sheets — we take these four models and ask the question: How much sea level rise do you get after 2,000 years when you elevate the temperature? Then we add them all together and we get a result for the total sea level contribution for different levels of warming and then we compare this to the paleological data. All of this gives a consistent picture, which says we can expect an increase in sea level of 2.3 meters for each degree of warming.

e360: Tell me a little bit about the paleo data?

Levermann: When you go into paleo records you can never use direct measurements because there was obviously no one around taking measurements 10,000 years ago or even longer. So that's why you use what we call proxy data, where we use certain chemical components or isotopes in order to make statements about, first, the temperature, and then the sea level. Sea level has an additional way we can derive it from, and that's simply from looking at the sea level that you see in the geological record. In some places around the world, you can simply see where the sea level was at certain times in history.

e360: Let's say we continue on the current path of emissions and that by 2100 we are 4-5 degrees Centigrade hotter than we are now. How long after that do you think you could begin to see significant sea level rise as the Antarctic and Greenland ice sheets begin to melt at a more rapid rate?

Levermann: Significant is very much defined here by society. The 20 centimeters [8 inches] that we have observed in the last 100 years are significant for the smaller island states in the Pacific, which are inevitably going to vanish in the future. And also, for example, tropical storm Nargis in Myanmar in 2008 went much farther inland because of this additional 20 centimeters than it would have in pre-industrial times.

So the question of what is significant is very much dependent on the coastline you look at and what society wants or can adapt to. I would say that a meter in the 21st century would be highly significant for the Netherlands and Europe, but also for London and Florida and New York and so on because you always have to add on top the storm surges.

We picked the 2,000 years date because it is far enough in the future so that the small scale variations and the sea level rise have been averaged out. So we can be quite certain that after 2,000 years this kind of sea level rise will be observed, but it could be well before that.

e360: If the conclusions of your research are correct, civilization is going to be looking at sea level

rise that could well exceed 5 meters [16 feet], or could be 10 meters within the next 2,000 years. These are really massive increases. What do you think your paper says about adaptation and what the world needs to be doing now about adaptation?

Levermann: What I would say in short is that we simply put expiration dates on certain cultures, on certain societies around the globe. Definitely for some small island states in the Pacific and in the tropics in general, but also for regions that are now low-lying, like the Netherlands and Bangladesh, and also regions in the U.S. And that simply poses the question of what kind of infrastructure we build, what buildings we build — the churches, the power plants, and so on. For what time period do we build them and is there a cultural heritage we have to abandon in the long run?

e360: Your term "expiration date" is striking. With 5 or 10 meters of sea level rise, you would be looking at an expiration date, if you would, for much of the world's coastal areas, would you not?

Levermann: I think it's culturally very important whether we have an open-ended future or whether we can say there's a limit to it. If you are living on a Pacific island, and you simply know that in 100 years your home won't be there anymore, then I would assume you build your society differently, you think differently about your children, about your grandchildren. And with these kinds of numbers we'll have to do something similar. People will have to reconsider what's home and how long you build a home for.

e360: How would you characterize society's understanding and acceptance of these facts at this point?

Levermann: There's one very important aspect to the adaptation problem and that is that people consider this to be a local problem and I would strongly argue against it. We are living a globalized world and our societies are relatively fragile already. Now after Fukushima — the Japanese catastrophe — we had supply failures in Europe in the automobile industry.

The same was true after the great recent Thailand flood — we had a shortage of hard drives in the U.S. and in Europe for months in 2012 and this was really not expected. So we had a remote event

which impacted us from afar. Now if we don't get hard drives for a while that won't collapse a society obviously. But what happens if we get a whole series of these kinds of impacts like Katrina and Sandy in the same year, and a drought and a heat wave that brings the California electricity sector into collapse or something. Will this stay within the U.S. or will it spread around the world? And this is why we need to consider adaptation as a global problem.

A lot of transportation routes at the moment depend on harbors or infrastructure that is close to the coastline. If, for example, a storm surge would destroy the harbor of Rotterdam, where a lot of containers go through, you would strongly disrupt the supply chains for a lot of production in different countries. This is why sea level rise and the associated storm surges directly lead into a global adaptation problem because what we have to do is we have to rearrange our supply network in a way that is robust against terror attacks of nature, if you like. That's in a sense what it is — it's not intentional, obviously that's why it is not a terror attack, but it's a localized disruption by nature on our supply chain, which requires a robust supply network. I believe that this global supply network would adapt by itself, if it was given the information about its vulnerability. We are planning to set-up a Web-platform similar to Wikipedia where such information is gathered and provided. It will be launched at www.zeean.net.

e360: When we are talking about 500 years, 1,000 years, 2,000 years, that's really distant in time. In 100 years one can imagine one's grandchildren for example, but in 2,000 years of course that's unimaginable. How do you get society to care about potential long-term impacts when they and their grandchildren will be long gone?

Levermann: This is a really difficult problem. It's not for climate scientists to decide — that should be decided by society. So society needs to decide about its time horizons with respect to its cultural heritage and how much damage it wants to do in the future and how much damage future generations can actually cope with. I haven't decided for myself what is really worthwhile saving and what is the price we are willing to pay for saving, for example, the coastline of Florida. But this cannot be solved by natural science obviously, so what we do is we put out the information about what is going to happen and then society needs to decide what to do. Do we want to keep the Tower of London, or do we just say this was nice for a few centuries but now it will be flooded in the next few hundred years.

I personally believe that we cannot adapt to a warming of 4 or 5 degrees [C] because the increase in extreme events and also sea level rise, combined with extreme storm surges, will simply increase the pressure on our complex societies, which might bring them to the verge of collapse. Obviously, we do not know whether this will happen, but I think that such a threshold is out there somewhere — we just do not know where. We do need to adapt to the climate change that cannot be avoided anymore, but we definitely need to mitigate any warming that we cannot adapt to.

"Leaving Our Descendants A Whopping Rise in Sea Levels", 24/07/2013, online at: http://e360.yale.edu/feature/leaving_our_descendants_a_whopping_rise_in_sea_levels/2675/?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=30bf8e10fd-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-30bf8e10fd-250657169

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❖ Worse floods ahead for UK as climate warms, say scientists

Airborne corridors which carry huge volumes of water, are set to get larger, causing more catastrophic floods

Heavy and prolonged rainfall will cause both more frequent and more severe flooding across the UK and the rest of north-west Europe as the atmosphere continues to warm, say British and American scientists

The study of these "atmospheric rivers", published in Environmental Research Letters, pins the blame for the increasing flood risk firmly on man-made climate change and says the same problem will afflict other parts of the planet.

The researchers describe how atmospheric rivers carry vast amounts of water vapour around the Earth, delivering heavy and prolonged rainfall, particularly to mountainous areas. They were responsible for the protracted winter and summer floods in the UK in 2012, which caused an estimated $1.6 billion (£1 bn) in damage.

In a warming world the atmosphere can carry more water and the research showed that the rivers, typically running a kilometre above the Earth, 300 kilometres wide and thousands of kilometres long, would become larger and capable of delivering even bigger quantities of prolonged rainfall.

An example of their potential danger is the atmospheric river that caused the severe flooding on 19 November 2009 over north-west Britain. As it approached the coast it was transporting a moisture volume 4,500 times the average gauged flow of the river Thames through London.

In California, where atmospheric rivers (ARs) have already been assessed, the climate models predict that the number of years with these features will increase. To discover what could happen in Europe the models were tested against the known flooding events between 1980 and 2005, and the researchers found that they could accurately simulate what actually happened.

This gave them confidence to test what would happen in the future. All the models showed that with more greenhouse gases emitted by humans there would be a doubling of the number of atmospheric rivers later this century compared with the 1980 to 2005 period. Most of these events occur in the winter, but in a warmer world the danger period is extended.

Because of the way the warmer atmosphere is able to carry more water and deliver much higher rainfall totals, the potential for far worse floods from each of these rainfall events is much increased.

The head of the research, Dr David Lavers, from the department of meteorology at the University of Reading, said: "ARs could become stronger in terms of their moisture transport. In a warming world, atmospheric water vapour content is expected to rise due to an increase in saturation water vapour pressure with air temperature. This is likely to result in increased water vapour transport.

"The link between ARs and flooding is already well established, so an increase in AR frequency is likely to lead to an increased number of heavy winter rainfall events and floods. More intense ARs are likely to lead to higher rainfall totals, and thus larger flood events."

The paper points out that while the scientists were specifically looking at the atmospheric rivers that caused heavy rainfall in Europe, these storms affect many temperate regions of the planet. As the atmosphere warms, it is likely that they will increase the risk of flooding elsewhere.

"Worse floods ahead for UK as climate warms, say scientists", 24/07/2013, online at: http://www.guardian.co.uk/environment/2013/jul/24/worse-floods-uk-climate-warms?CMP=twt_fd&utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=cd44c8c995-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-cd44c8c995-250657169

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