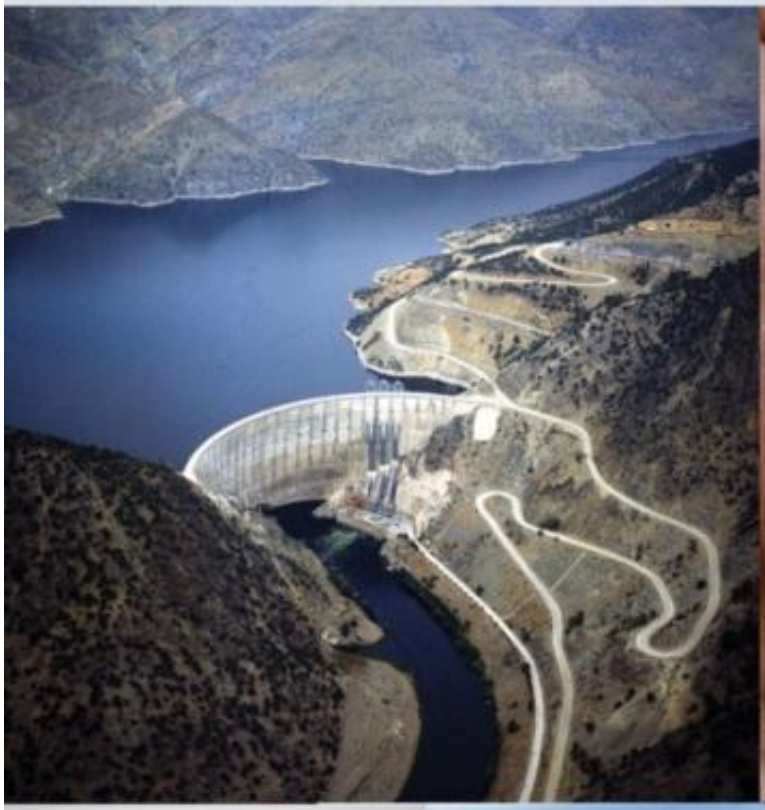


ORSAM WATER BULLETIN

Weekly Bulletin by ORSAM Water Research Programme

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





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ORSAM WATER BULLETIN

16 September 2013 – 22 September 2013

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- **Judge halts construction of Amazon dam on Brazil's Teles Pires river**

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❖ WEG helps deliver water to region in Turkey badly hit by drought

WEG has supplied reliable and robust motors to a major project in Turkey – the Suruç Plain Irrigation – and the fifth largest tunnel in the world, which aims to provide drinking water and water for crop irrigation to Suruç City and its 135 residential areas.

Two years of general drought in Turkey has increased deprivation of the country's poorest population. Without water to drink or irrigate crops, the nearly 70,000 inhabitants of the agricultural district of Suruç are suffering the effects of the climate changes. The region has received funding for economic development with the "Suruç Plain Irrigation", a project which is part of the Southeastern Anatolia Program (GAP), and will irrigate over 94,000 hectares.

The total cost of the GAP project is estimated to be £20 billion and is focused on improving energy, irrigation, social infrastructure and international cooperation. The water resources development section of the program involves the construction of 22 dams and 19 hydraulic power plants and the irrigation of 17,000 km2 of land.

Work on the irrigation canal began in March 2009. It is currently in the excavation phase and is expected to be completed by the end of the year. Besides the irrigation canal, the fifth largest tunnel in the world is under construction, which is designed to transport 90 tons of water per second along its 17 kms.

The project needed robust pumps and equipment to move the water from the Atatürk dam in the Euphrates River to the irrigation canal. WEG has supplied eight medium-voltage asynchronous motors, to drive the pumps that transport water to the irrigation canal. Each motor is four metres tall and weighs 34 tons.

WEG has a longstanding 20-year relationship with its distributor Dal-Group, in the electric industry, who recommended the company's reliable motors and who supplied them to the final customer Samsun Makina Sanayi (SMS), in the infrastructure and irrigation sector.

"This project is very important for Turkey since it aims at stimulating the migration to the northeast of the country, thus relieving big cities and improving the population's income and life quality in the region," explains Özer Ertokmac, Sales and Service Manager of Dal-Group.

In the Suruç region, the irrigated agriculture has been adopted in some simple crops and in the industrial production, thus increasing the culture in some plains.

"WEG helps deliver water to region in Turkey badly hit by drought", 20/09/2013, online at: http://www.pandct.com/media/shownews.asp?ID=38220

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❖ Water resources and dams in Iraqi Kurdistan

Kurdistan Regional Government (KRG) Prime Minister Nechirvan Barzani laid the foundation stone for the construction of the Gomaspan-Bastorah dam, 30 kilometers from the city of Arbil, last week.

This project, which is estimated to cost some $90 billion, it is aimed at taking advantage of and developing the rich water resources in Iraqi Kurdistan. The lack of development of water resources has caused significant damage to agriculture and the entire agricultural sector, especially during dry periods.

The KRG is also preparing other dam projects and has announced that the construction of three major dams in the region is expected to be completed by 2018. The Gomaspan-Bastorah dam, where the recent ceremony was held, is estimated to be completed in 1,800 days. The dam, to be built by the Turkish company Ataç İnşaat, will be the biggest construction project in the region since the first Gulf War, at a height of 70 meters and with a storage capacity of 3.75 million cubic meters of water.

There are currently three major dams within the borders of the KRG: the Dukan, Darbandikan and Duhok dams. The total water storage capacity of the three dams is 9.85 billion cubic meters. There are also many other small dams within the province of Duhok, with an additional total storage capacity of 1.505 billion cubic meters. Some 850 hectares of land is irrigated through those small dams. The KRG hopes to create a total water storage capacity of 38 billion cubic meters with the new dam projects.

Iraqi Kurdistan is a highland area rich in water resources. The Khabur River, which meets the Tigris River before reaching Baghdad; the Great Zab River; the Little Zab River; the Sirwan River and the Udhaim River are all significant water sources in the region. While these rivers are generally fed by rain and snow, low precipitation in the region during certain periods leads to drought. Another reason for building dams is to store water for use during dry spells. The dry period between 2001 and 2004 caused a particularly great water shortage in the region. Ground water is also used for drinking and agricultural purposes in the region. Erbil is located in a region that is richer than other provinces, especially Sulaymaniyah, in terms of available ground water. Sulaymaniyah province has difficulty meeting the water needs of the population.

As in the Middle East in general, ground water is widely used in some regions of Iraq where surface water is not sufficient to meet the water demand. The management of wells in the KRG is controlled by the provinces. According to the Ministry of Water Resources, there are a total of 15,514 legal wells installed for drinking water in Duhok, Sulaymaniyah and Arbil provinces in the KRG. In addition 17,530 illegal wells have been identified. While the number of legal wells dug for agricultural purposes is 3,559, there are also another 2,230 illegal wells for the same purpose. Finally, there are 320 wells for industrial purposes. As a result of the intense use of ground water, the water level in the region has fallen from 200 meters to 400 meters.

The new dams to be built in the KRG are designed to meet the water requirements for agricultural purposes, as well as to decrease the existing pressure for water for tourism purposes and especially on the use of ground water, in order to increase the ground water levels again. The misuse of water resources is already ringing alarm bells for both surface waters and also ground water reserves for the near future. In concert with the dams that are being constructed in the KRG, the development of reasonable water resource management is also on the agenda.

In the past, the Arab peasants in Kirkuk complained that the amount of water released from the Dukan Dam was insufficient and that it was a policy implemented by government in Erbil on purpose. It is likely that dams will continue to be a source of tension regarding the use of water resources among the ethnic groups in the KRG. In addition, developing these water resources will also affect the waters flowing to south of the country and those who use them.

"Water resources and dams in Iraqi Kurdistan", Tuğba Evrim Maden, Todays Zaman, 21/09/2013, online at: http://www.todayszaman.com/news-326911-water-resources-and-dams-in-iraqi-kurdistan.html

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❖ Iraq to spend $1.5bn on water and sewage projects

Iraq plans to spend in the region of $1.5bn (IQD 1,744.6bn) on water and sewage projects over the next two to three years, according to the country's municipal affairs minister.

Adil Mhoder, Municipalities and Public Works Minister, told Reuters that there will be a total of 50 such projects related to building sewage infrastructure and securing portable water from the Tigris-Euphrates river system, and that these would be open to foreign contractors.

"What was allocated to projects that will be awarded in 2014 is $1.5bn annually for two to three years," Municipalities and Public Works Minister Adil Mhoder said on the sidelines of a conference in Dubai.

"We will ask companies to bid for them in 2014," Mhoder said. "By the end of 2013, these projects will have passed the planning phase and will be needing implementation."

"Iraq to spend $1.5bn on water and sewage projects", 18/09/2013, online at: http://www.constructionweekonline.com/article-24324-iraq-to-spend-15bn-on-water-and-sewage-projects/#.Uj0-RtKe_PY

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❖ Iraq plans massive investment in water sector

Iraq is to spend billions of dollars over the next two to three years on 50 water and sewage projects that would be open to work by foreign contractors, the country's municipal affairs minister said.

He said the Iraqi government was taking steps, including facilitating the issue of visas to businessmen, to encourage foreign contractors to set up shop in the violence-torn country.

Foreign contractors are reluctant to carry out much-needed infrastucture projects in Iraq as a result of slow bureaucratic procedures and an unstable political and security environment.

"What was allocated to projects that will be awarded in 2014 is $1.5 billion annually for two to three years," Municipalities and Public Works Minister Adil Mhoder told Reuters on the sidelines of a conference in Dubai on Tuesday.

Mhoder said the new projects, which he numbered at 50, were related to building sewage infrastructure and securing portable water from the Tigris-Euphrates river system.

"We will ask companies to bid for them in 2014," Mhoder said. "By the end of 2013, these projects will have passed the planning phase and will be needing implementation."

He said the government was taking steps to reduce bureaucratic procedures, including speeding up the process of awarding contracts and making it easier for foreign investors to obtain entry visas into the country.

The government has already authorised heads of diplomatic missions to issue visas for businessmen and investors within 48 hours, he said.

In its attempt to bring in reluctant contractors, the Iraqi government is also offering letters of credit that could be used by contractors who need to import equipment and other supplies, the minister said.

Mhoder said his ministry currently oversees at least 50 infrastructure projects, most of them involving companies from Asia and the Middle East, which are more willing than their Western counterparts to take on risk, according to one Iraqi contractor at the conference.

China, Turkey, Iran, India, Malaysia and the UAE as well as some European firms are currently invested in the sector.

On Monday, Construction and Housing Minister Mohammed al-Daraji told Reuters Iraq would spend around $10 billion on infrastructure projects this year, with the country aiming to increase this to more than $15 billion annually by 2016.

Despite government plans to spend billions of dollars over the coming years, few foreign firms have been willing to build in Iraq.

About 800 Iraqis were killed in August, the United Nations estimates. The bloodshed, 18 months after U.S. troops withdrew, has stirred concerns about a return to the sectarian slaughter of 2006-7, when the monthly death toll sometimes topped 3,000.

"Iraq plans massive investment in water sector", 18/09/2013, online at:
http://www.tradearabia.com/news/CONS_242960.html

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❖ Study Underway on Transfer of Caspian Sea Water to Lake Oroumiyeh: Minister

TEHRAN (Tasnim) – Iranian Energy Minister Hamid Chitchian said a study has begun to determine whether it is feasible to transfer the Caspian Sea water to Lake Oroumiyeh in northwest of the country, with the aim of replenishing the endangered lake.

"The plan for transfer of the Caspian Sea water to Lake Oroumiyeh is in the study stage, and we are conducting environmental and technical studies to find out whether such transfer is possible or not," Chitchian said on the sidelines of the Iranian cabinet's weekly meeting here in Tehran on Wednesday.

He also added that his ministry has called on the academic and research centers to propose remedies that would help save the shrinking lake.

In separate remarks on Saturday, Chitchian had underlined the government's determination to save the endangered lake, which has lost more than sixty percent of its surface in recent years.

"We will make every effort to prevent the drying up trend in Lake Oroumiyeh," the Iranian minister had told Tasnim News Agency in Iran's northwestern city of Oroumiyeh.

As Lake Oroumiyeh is shrinking and deserts of salt expanding, Iranian officials are trying to find ways to avert an imminent disaster and to stop the salt lake from drying up.

One of the largest salt lakes in the world and classified as a Biosphere Reserve by UNESCO, Lake Oroumiyeh has lost more than 60 percent of its surface over the last two decades due to drought and the damming of rivers feeding it.

The disappearance of the lake could leave behind billions of tons of salt which in turn displace millions of people and endanger the ecosystem of all surrounding areas, whose economy relies on agriculture and tourism.

"Study Underway on Transfer of Caspian Sea Water to Lake Oroumiyeh: Minister", 18/09/2013, online at: http://www.tasnimnews.com/english/Home/Single/143691

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❖ Syria violence caused by … water supply?

Imagine a world where climate change – and a dwindling water supply – may have helped fuel Syria's civil war.

Five years before Syria was awash in sectarian bloodshed, it was in the midst of a devastating drought – one of the worst in modern times.

The numbers are staggering.

According to the center for climate and security, from 2006 to 2011, the unprecedented drought scorched 60 percent of Syria's land – killing 80% of the livestock in some regions, putting three quarters of the farmers there out of work, and ultimately displacing 1.5 million people.

And that was before the bloody conflict that has so far scattered four million more inside the country and sent two million refugees streaming across Syria's borders.

While no one is claiming a direct cause and effect, the drought did bring on the diaspora from dying farms to over-crowded cities – and thereby put enormous economic and social pressures on an already fractious society.

And Syria is far from an isolated case.

Scientists warn that with severe water shortages in Yemen and other countries in the region, the climate of violent revolution may spread.

Water was also the stumbling block in peace talks between Israel and Syria 13 years ago.

That's when Bashar al-Assad's father, Hafez al-Assad, insisted on retaining a tiny stretch of the Sea of Galilee – or the Kinneret, as the Israelis call it – and which provides Israel with much of its water.

In fact, then-Prime Minister Ehud Barak ran on the campaign slogan: "no Syrian soldiers will splash their feet in the Kinneret."

"Syria violence caused by … water supply?", 20/09/2013, online at: http://amanpour.blogs.cnn.com/2013/09/20/syria-violence-caused-by-water-supply/

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❖ Why water is key to Syria conflict

Editor's note: Michael Shank is director of foreign policy at the Friends Committee on National Legislation. Emily Wirzba is program assistant for Sustainable Energy and the Environment at FCNL. The views expressed are their own.

The agreement forged by Russia and the United States over the weekend on Syria's chemical weapons is good news for diplomacy, and bodes well for any restart of the Geneva II peace process aimed at ending the country's civil war. But the short-term focus on chemical weapons use risks undermining some much-needed long-term thinking on the issue.

Of course, both sides in the Syrian conflict need to be held accountable for their alleged use of (or, in the case of some rebels, their **alleged** attempts to acquire) chemical weapons. But even after any stockpiles have been accounted for and dealt with, there will still be the outstanding question of how to resolve the ongoing civil war.

And the Obama administration should belatedly be willing to address a surprising source of the current tensions – water shortages. Indeed, the sad fact is that the United States could have helped prevent tensions in Syria from escalating into civil breakdown if it had worked with the international community to tackle a growing problem with this most basic of resources.

In the years leading up to Syria's civil war, the country experienced a devastating drought, impacting over 1.3 million people, killing up to **85 percent of the country's livestock** in some regions, and forcing as many as **160 villages to abandon their homes** due to crop failures.

Back in 2009, as President Obama was taking office, there was **talk** of how Syria's water scarcity problem could spark major social and economic instability. Indeed, the International Federation of Red Cross and Red Crescent Societies published an **Operations Report** on the Syrian drought, noting that some 800,000 people were severely vulnerable, and "over the past three years, their income has decreased by 90 percent and their assets and sources of livelihood have been severely compromised." The National Oceanic and Atmospheric Administration for its part released a **study** in 2011 linking more frequent droughts in the Mediterranean and the Middle East to climate change, noting Syria was experiencing the worst drying in the region.

More from GPS: Give credit for seizing lucky break

Yet despite such alarm bells, the United States failed to move to mitigate the devastating impact the drought was having.

A 2008 **cable** sent from Syria underscored the dire situation, with Syria's agriculture minister stating publicly that the economic and social fallout from the drought was beyond the country's capacity to cope with. In a direct appeal to the United States, the U.N. Food and Agriculture Organization **representative in Damascus expressed his hope** that "improving relations" between the United States and Syria might encourage the U.S. to become a donor to the 2009 drought appeal.

Yet the **U.S. government** appears to have balked at the appeal for greater assistance, responding: "Given the generous funding the U.S. currently provides to the Iraqi refugee community in Syria and the persistent problems WFP is experiencing with its efforts to import food for the refugee population, we question whether limited USG resources should be directed toward this appeal at this time."

As a result of lackluster U.S. leadership, the global response was weak: Donor countries coughed up **$5 million**, a mere quarter of the total that had been requested.

How did Syria end up in this resource predicament? For decades, Israel has occupied one of Syria's key water resources, the Golan Heights, where as much as **one-third of Israel's water supply** comes from. It's a resource that Syria has badly needed to tap.

But the Syrian government's mismanagement of water resources also contributed to the problem. A combination of growing water-intensive wheat and cotton, inefficient irrigation techniques like flooding, and leaky water distribution networks, have seen enormous quantities of water wasted. Syria also **sold** most of its wheat reserves when global prices were high, forcing the country to later import large amounts of wheat during the drought years. Desperate, farmers drilled illegal water wells, depleting an already-low water table and causing an increase in the salinity of the water. Indeed, within eight years, the number of wells drilled almost doubled to **213,000**.

As the *New York Times* **notes**, the Syria government eventually began "to acknowledge the scale of the problem and…developed a national drought plan," while also attempting to obtain international funding for programs to address the widespread failure of crops. But lack of funding undermined these efforts.

Sadly, Syria is not alone – Yemen is another country on the regional stability risk list as a result of its **severe water shortages**. And although sectarian tensions clearly play a significant role in the

current regional unrest, it should also be clear that water shortages and their knock-on effects are in many cases the match that lights a firestorm of discontent and violence.

If the United States wants to do something constructive to address potential flashpoints in the Middle East it would do well to address the root causes of tensions. And it will find ensuring that local populations have access to adequate resources far more effective – and less costly – than firing off more missiles.

"Why water is key to Syria conflict", 17/09/2013, online at: http://globalpublicsquare.blogs.cnn.com/2013/09/17/why-water-is-key-to-syria-conflict/

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❖ Water Wars: Is It Just a Mirage?

Within the last decade, climate change has become a hotly debated topic. Many people struggle to imagine what the effects of climate change will be and whether the danger is real. At the heart of climate change, however, there are some very real and imaginable effects that may be seen within the near future. Perhaps the most prevalent of these is a threat to the global supply of fresh water.

Ban Ki Moon recently stated at the United Nation's International Day of Biological Diversity: "We live in an increasingly water insecure world where demand often outstrips supply and where water quality often fails to meet minimum standards. Under current trends, future demands for water will not be met." This year, 500 scientists who met in Bonn, Germany on May 17 have released a joint statement estimating that the majority of the people on Earth will face severe challenges to accessing fresh water within two generations time.

As water is such a seemingly copious and renewable commodity to many, it may appear ridiculous to state that it is a serious threat to global stability. Yet in reality, water irrigates farms, is used in energy production and, most importantly, is necessary for survival. Water is priceless and the Earth is running out of it.

Previously, limited oil supplies were seen as the most likely cause of war, but now many experts are coming to view water supply as a key factor to the threat of global conflict. The reason for this is that in regions where nations compete for access to water, the relations between the countries are likely to be unstable, especially where water supply is scarce. With roughly 1,250 square km of fresh water remaining in the world's semi-arid and arid regions and distributed unevenly between countries sharing the same water source, governments around the world may turn to military intervention as a solution.

The Effects of Climate Change

The impact on fresh water supply from climate change is mainly due to the observed and projected increases in temperature, sea level and precipitation variability that will come with it. The glaciers that feed river basins for more than one sixth of the world's population are melting and will not come back. Semi-arid and arid areas, such as the west of the United States, the Mediterranean basin,

southern Africa and northeastern Brazil, will be severely hit by this change in global climate. Increases in evaporation will drain large lakes such as the Great Lakes of North America. Compounding this is the fact that climate change is likely to cause an increase in the frequency and severity of droughts, floods, heat waves and storms.

All of these problems will be exacerbated by an increasing global population, and with this, increased urbanization, where the pollution of existing fresh water will only get worse. Today, approximately 4.5 billion people live within 50km of a source of water that is degraded.Charles Vörösmarty, a professor at the Cooperative Remote Sensing Science and Technology Centre, stated: "We have discovered tipping points in the system. Already, there are 1 billion people relying on ground water supplies that are simply not there as renewable water supplies."

The problem is not just limited to drinking water. Food supply is heavily dependent on sources of water for irrigation. Wells are drying up and underwater tables are falling so fast in the Middle East, parts of India, China and the US, that food supplies are seriously threatened. The prospects of this shortage are grim.

A Security Issue?

Surely this is a development issue, so why then will water scarcity be a source of potential conflict? The problem is that there is a lack of international law and inter-country consensuses regarding fresh water reserves. There have already been worrying examples of confrontations. Relations between Egypt and Ethiopia have become increasingly tense following Ethiopia's announcement of the construction of a major dam across the Nile River. Egypt has complained that this will drastically alter their supply of fresh water. As there is no definitive treaty between the two countries regarding ownership of the Nile, the situation is hard to resolve.

Mohammed Morsi, the deposed Egyptian president, promised to "defend each drop of Nile water with our blood." Both Egypt and Ethiopia are heavily dependent on fresh water as their climates are continually bordering on drought, and as their energy requirements would thrive from hydroelectric power. The potential benefits of securing the Nile therefore are significant, especially as the reliance on it will only increase — perhaps enough to warrant intervention or war.

The problem lies in the fact that the majority of water sources in this region cross borders, which are shared among multiple countries, such as the Jordan River Basin and the Tigris-Euphrates Basin. With few agreements on how to share these resources, there is every chance of these disputes spilling over into conflict – demonstrated by the increased hostilities between Turkey and Syria over the use of the Euphrates River.

These are not the only examples of countries risking less than cordial relations in order to harness the potential of hydrological power. China and India are engaged in a huge "water grab" in the Himalayas, as they seek new sources of electricity to power their economies. Indian geopolitical analyst Brahma Chellaney, stated: "China-India disputes have shifted from land to water. Water is the new divide and is going center stage in politics."

There is a dire lack of international law regarding water ownership. Water, in theory,cannot be owned, but it is possible for a country at the source of water to "turn off the tap." Unfortunately, there are few precedents for the UN International Law Commission or the International Court of Justice to establish rules to arbitrate on water sharing. Additionally, there is no law preventing a stronger nation from denying a weaker one access to water.

Throughout history, water access has been a source of conflict and, more recently, there have been marked examples where it has brought about a number of wars, such as in 1987 and 1989 when Senegal and Mauritania fought two limited wars across the Senegal River.

This is only likely to get worse as the dependency on water resources become more extreme. The reliance on water for so many essential parts of life can lead to both instability within and between countries. The problem is probably best described by Ed Davey, the British energy secretary, who stated: "Climate change intensifies pressures on states, and between states... Its effects can lead to internal unrest... and exacerbate existing tensions. We have to plan for a world where climate change makes difficult problems even worse."

Climate change is likely to exacerbate existing tensions, especially as fear of thirst and hunger are such instinctual forces that can lead to desperate acts. Given the importance of water as a source of

food, electricity and survival, the costs of not having enough of it are worth the cost of war, especially when there is no international law arbitrating it.

Is There a Solution?

Is there any hope that this crisis can be avoided? The Intergovernmental Panel on Climate Change has recommended a strategy of Integrated Water Resources Management. It should "include capturing society's views, reshaping planning processes, coordinating land and water resources management, recognizing water quantity and quality linages, conjunctive use of surface water and groundwater, protecting and restoring natural systems, and including consideration of climate change."

While it may not be physically possible to restore water sources to their previous level, how do we replenish water sources if there is not enough water? The climate has been altered so drastically that there may be no quick fixes. Even if a miracle solution was theorized, it may not be economically, politically and socially feasible to implement, especially for developing countries where the effects of water scarcity are most likely to be seen. Perhaps the first step should be to devise international law that could possibly prevent the tragic outbreak of war over what should be a right for all: the access to water.

"Water Wars: Is It Just a Mirage?", 16/09/2013, online at: http://www.fairobserver.com/article/water-wars-just-mirage

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❖ Water scarcity will be at 'alarming levels' by 2025, GCC warned

DUBAI // A grim scenario of water shortages, desertification and extreme soil salinity has been forecast for the Arabian Gulf, possibly within the next 12 years.

With water scarcity predicted to reach alarming levels by 2025 in the Middle East, government officials and experts are seeking more research into ways to reverse the damage caused by climate change.

"This area was water and desert 40 years ago," said Ahmed Al Mansouri, a member of the FNC and former researcher in preservation.

"But things have changed. The world is facing a threat to water and arable land, and food security isn't as given as we think. Such threats pose health threats to humanity."

Mr Al Mansouri was speaking at the National Research Foundation's symposium on sustainable management of soil and water resources.

"Scientists and researchers are looking for solutions," he said. "The replacement of our current resources is an important strategy and we need policy-making for water and soil usage."

The Middle East and Arabian Gulf are expected to fall under the "physical water scarcity" category by 2025, in the worst scenario.

"It's the most scarce area," said Dr Ismahane Elouafi, director general at the International Centre for Biosaline Agriculture in Dubai. "And by 2050, it'll only get worse."

Water supplies are being depleted in GCC countries at among the quickest rates in the world. Among Arabian Gulf countries, the rate of depletion in the UAE is second only to that in Kuwait.

"The Middle East is one of the most vulnerable regions to climate change, salinisation and desertification," Dr Elouafi said.

"The magnitude of the problem requires strong cooperation among national research and development programmes, private sectors and donors."

With temperatures expected to increase by up to 2.5°C by 2050 and a decrease in annual rainfall of 10.5 per cent in the Middle East, severe water shortages, desertification, coral-reef bleaching and more disastrous events – such as drought and floods – are anticipated.

"All of them are very alarming and all of them have been scientifically proven," Dr Elouafi said.

"We have to tackle it by improving water and soil management, improving salt-tolerant varieties of forage, dates and bioenergy trees, and support capacity building and agricultural institutions."

Poor farm management methods must change, she said.

"Nearly 1.6 million hectares of land are lost globally each year due to salinisation and 53.1 million hectares are affected by salinity in the Near and Middle East," Dr Elouafi said.

"At this rate, all irrigated areas that now contribute to agricultural foods will be out of production in 140 years. This is due to mismanagement, but there is a way to stop and reverse it."

In the UAE, more than 31 per cent of existing farms are unsuitable and 20,000 are abandoned, mainly in Abu Dhabi's Western Region, due to water and soil salinity.

"Salinity is a major threat to the sustainability of agriculture but there's no innovation without research, so we have to invest in research," Dr Elouafi said.

"We have to identify new and improved salt-tolerant germplasm to sustain the ecosystem productivity in changed climates, and we have to develop an alternative production system and technologies."

Scientific research will also have to expand.

""We need more collaboration between universities and local government departments," said Dr Husam Al Ulama, the foundation's director.

"Researchers are also short on budget. We have one but it's not enough to cover and encourage all researchers."

The culture and priorities of the UAE will have to shift to avoid the coming problems.

"We have a lack of research culture," Mr Al Mansouri said. "We have a gap between the East and the West, intellectually, and it's widening so we should invest in ethical standards and the transfer of know-how to narrow that gap.

"Now, we're talking about risk management but in a few years we'll be talking about crisis management. We can't live in the comfort zone.

"If the world is affected then so are we, so we have to equip the people here and empower the research community."

"Water scarcity will be at 'alarming levels' by 2025, GCC warned", 16/09/2013, online at: http://www.thenational.ae/uae/environment/20130916/water-scarcity-will-be-at-alarming-levels-by-2025-gcc-warned

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❖ Will the Dead Sea be eaten by sinkholes? Huge chasms are appearing in the region at a rate of one per day

The Dead Sea is drying up at an incredible rate leaving huge chasms of empty space in its wake. These chasms appear in the form of large, devastating sinkholes and are increasing in number throughout the region.

Experts claim they are now forming at a rate of nearly one a day, but have no way of knowing when or how they will show up.

Estimates by **Moment magazine** suggest that, on the Israeli side alone, there are now over 3,000 sinkholes around the Dead Sea.

This compares to just 40 counted in 1990, with the first sinkhole appearing in the 1980s.

The Dead Sea spans more than 60 miles through Israel, the West Bank, and Jordan.

Its waters are 10 times saltier than the northern Atlantic Ocean because it has no outlet. This means that any minerals that flow there, stay there.

The Dead Sea spans more than 60 miles through Israel, the West Bank, and Jordan. Its waters are 10 times saltier than the northern Atlantic Ocean because it has no outlet. This means that any minerals that flow there, stay there

The increase in sinkholes is directly related to the Dead Sea drying up at a rate of one meter per year.

Sinkholes are basically bowl-shaped features that form when an empty space under the ground creates a depression.

The depression is the result of a reaction between freshwater and salt buried in a subterranean level beneath the surface.

When the freshwater dissolves the salt, it creates a void, causing the landscape around and above it to suddenly collapse.

Over the last few decades, increasing numbers of people have been drawn to the Dead Sea causing its salt water to dry up.

This leaves more fresh water in the area to dissolve the salt and create more cavities.

One solution being presented by the World Bank is to create a canal linking the Dead Sea to either the Red Sea.

But environmentalists warn that doing this could spell the end for the Dead Sea.

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Experts believe more needs to be done to highlight the plight of the Dead Sea and come up with a solution.

For instance to bring the world's attention to the challenge artist Spencer Tunick shot the first mass nude shoot in the Dead Sea in 2011.

'Human intervention has just about killed the Dead Sea,' Alon Tal, professor in the Department of Desert Ecology at Ben-Gurion University of the Negev, told Moment magazine.

'It will take extraordinary human measures—careful, wise intervention and positive regional cooperation—to save it.'

WHY IS THE DEAD SEA DRYING UP?

The Dead Sea spans more than 60 miles through Israel, the West Bank, and Jordan.

Its water level has fallen from 394 meters below sea level in the 1960s to about423 meters below sea level as of end 2012.

As a result, the Sea's water surface area has been reduced by one third: from roughly 950 square kilometers to 637 square kilometers today.

The water level continues to drop at an alarming pace of 0.8 to 1.2 meters per year.

The significant decline of the water level over the past 30 years is due to diversion of water from the Jordan River and from the Dead Sea itself due to population increase.

"Will the Dead Sea be eaten by sinkholes? Huge chasms are appearing in the region at a rate of one per day", 18/09/2013, online at: http://www.dailymail.co.uk/sciencetech/article-2424549/Will-Dead-Sea-eaten-sinkholes-Huge-chasms-appearing-region-rate-day.html?ito=feeds-newsxml

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❖ Israel Pipeline to Double Water Supplies to Thirsty Gaza Strip

Israel will build a pipeline that doubles the amount of water sold to the Palestinian Authority for Gaza Strip residents, a Defense Ministry spokesman said.

The new pipeline will increase supplies to the Gaza Strip to 10 million cubic meters, spokesman Guy Inbar said today in a phone interview. The West Bank water allotment will rise by 4 million cubic meters to 57 million.

Boosting water supplies and building materials are among the steps that create a "more positive atmosphere," said former U.K. Prime Minister Tony Blair, representing Western powers supporting efforts to resolve the Israeli-Palestinian conflict. Israel increased construction materials allowed into Gaza as well and will provide more permits for West Bank Palestinians to work in Israel, Inbar said.

Some 90 percent of the water from an aquifer that supplies Gaza, home to 1.6 million Palestinians, is unsafe for drinking, the United Nations said in a report last year. That aquifer may become unusable in three years and irreversibly damaged by 2020 unless pumping stops and major infrastructure upgrades are made, it said. About 2.7 million Palestinians live in the West Bank.

The water and materials requests were sought by Palestinian President Mahmoud Abbas, the official Palestinian news agency Wafa said. While Gaza is ruled by Hamas, the militant Islamist group that took power in 2007, Abbas's Palestinian Authority deals with Israel for supplies in Gaza.

Hamas, which seeks Israel's destruction, is considered a terrorist organization by the U.S. and European Union.

"Israel Pipeline to Double Water Supplies to Thirsty Gaza Strip", 17/09/2013, online at: http://www.businessweek.com/news/2013-09-17/israel-pipeline-to-double-water-supplies-to-thirsty-gaza-strip

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❖ The Dead Sea Is Dying

Sinkholes. Habitat destruction. Perilously low water levels. Can a dying sea be saved?

EIN GEDI, Israel—Ten years ago, during a routine early-morning solo tour of the area surrounding his kibbutz, Ein Gedi, on the shores of the Dead Sea, geographer-geologist Eli Raz heard an ominous rumbling noise. Raz, who is widely considered Israel's foremost expert on sinkholes—those terrifying crater-like holes that open up without warning—immediately knew that he was about to be swallowed up.

Sitting in his windowless, cramped office on the kibbutz, Raz, 70, a wiry, sun-wizened man with thick silver hair, tells his tale calmly. "I fell in, tumbling down, deeper, deeper. I thought I'd be buried alive. Instinctively, I started to dig upward, and realized that I was lucky—not much earth had fallen in, and I had landed on a sort of ledge. I could breathe. As the dust settled, I could see the sunlight at the top. But climbing out wasn't an option—I was afraid the hole would collapse on top of me. I was even afraid to move.

"I realized that I had my pack with me—a camera, a flashlight, a pen, a piece of paper, and toilet paper. I didn't have water. I had my cellphone, too, but it doesn't work from deep inside the earth," he adds. He was confident that the kibbutz rescue team—which he had established and trained—would eventually realize that he was missing and come rescue him. Meanwhile, Raz, ever the industrious scientist, began taking photographs. "After all," he quips, "how many times do we get an opportunity to take pictures of a sinkhole from inside?"

As time passed, he began to write to his wife, children, and grandchildren to help keep calm. He wrote on the piece of paper and then the toilet tissue, finishing by nightfall. In his office, Raz fishes through an office cabinet stuffed with documents and takes out a small tin box. Carefully, he unrolls the toilet paper, covered with his neat, thin writing and shows it to me. "I won't tell you what I wrote," he says. "It was meant only for my family."

Sinkholes in this region, he explains, are the result of the interaction between freshwater and a subterranean salt layer, buried beneath the surface. The freshwater dissolves the salt, creating an underground void, which causes the surface to collapse suddenly. Scientists have no way to determine when, or even precisely where, a sinkhole may open. But they are opening around the Dead Sea at an alarming rate of nearly one a day. The first ones appeared in the 1980s, and by 1990, there were about 40. Today, Raz estimates, there are more than 3,000 around the Dead Sea on the

Israeli side alone. The reason? The Dead Sea is drying up, and dropping salt water levels mean there is more fresh water to eat away at the salt. "Sinkholes are caused by human irresponsibility," he says. "For more than 30 years, I've been studying them and trying to warn everyone—especially government officials—that if we don't do something about the situation in the Dead Sea, the sinkholes will swallow us up."

After 14 hours, the kibbutz rescue team found Raz and extracted him from the sinkhole, which was nearly 27 feet deep. He was dehydrated, and his muscles ached from crouching for an extended time in the same cramped position, but otherwise he was unharmed. It took a few days before the irony dawned on him—the Dead Sea had taken its revenge on him, of all people.

* * *

The Dead Sea is known by many names: In Hebrew it is Yam Hamelach, the Salt Sea; in Arabic it is al-Bahr al-Mayyit, the Dead Sea and also Bahr Lot, Lot's Sea. Spanning more than 60 miles through Israel, the West Bank, and Jordan, it sits 1,388 feet below sea level and is the lowest place on the surface of the planet. The appellation "sea" is a misnomer: It is technically a lake at the end of the Jordan River. Its waters are salty, not because they are seawater, but because there are no outlets, and untold quantities of minerals, including salt, have been deposited there. The Dead Sea, in fact, is more than 10 times saltier than the northern Atlantic Ocean, making it unable to support any life other than microbes.

The sea has survived for millennia thanks to a steady equilibrium between water flowing in from the Jordan River and water evaporating out in scorching heat that, on summer days, often tops 120 degrees. This equilibrium between water flowing in and out was maintained as long as the region was sparsely settled, as it has been throughout history. Thought to be the site of the biblical Sodom and Gomorrah, the basin and surrounding hills attracted fanatics and hermits, believers and contemplators, but never in great numbers. A temple high up in the hills overlooking the sea dates back to the Chalcolithic period (between 4500 and 3500 BC). At the beginning of the Common Era, the mysterious sect of Essenes set up their community in the remote region, leaving behind the Dead Sea scrolls buried in jars in nearby caves. Not far away, on the rocky plateau of Masada, Herod the Great built palaces for himself, and in 73, 960 Jewish zealots committed suicide en masse rather than submit to Roman rule.* According to first-century historian Josephus Flavius, Emperor Vespasian threw chained slaves into the body of water to test its legendary buoyancy. Fortunately the salt-laden

heavy water kept them afloat. Later, Byzantine monks built their monasteries here, Crusaders their castles.

But over the past 50 years, increasing numbers of people and industries have been drawn to the Dead Sea's environs. Even more of a problem, the combined population of Jordan, Israel, and the Palestinian territories has nearly quadrupled from some 5.3 million to more than 20 million. These countries—plus Syria and Lebanon—have tapped the Jordan River and its tributaries, and the Dead Sea has paid the price. A few generations ago, more than 343 billion gallons of fresh water rushed from the Kinneret (also known as the Sea of Galilee) through the Jordan into the Dead Sea; today, fewer than 26.4 billion gallons trickle in.

Israel's largest water project, the National Water Carrier, diverts water from the Kinneret that would have fed the Dead Sea to supply the center and the southwest of the country. Jordan, through its King Abdullah Canal, reroutes more than 90 percent of its share of the Jordan River to farmland, taps, and bathrooms. Then there's Syria, which siphons off water from the Jordan's northern tributary, the Yarmuk River. At the same time, the Israel Chemicals Company and the Jordanian Arab Potash Company located on the southern rim of the Dead Sea pump out giant amounts of water to fill the evaporation pools needed to extract minerals, primarily potash and magnesium. This alone, experts say, is responsible for about 30 to 40 percent of the decrease in water levels.

As a result, the Dead Sea is shrinking by more than three feet a year and receding from the shore at an even higher rate. "Human intervention has just about killed the Dead Sea," says Alon Tal, professor in the Department of Desert Ecology at Ben-Gurion University of the Negev, author of *Pollution in a Promised Land: An Environmental History of Israel* and an expert on the Israeli environment and ecology. "It will take extraordinary human measures—careful, wise intervention and positive regional cooperation—to save it."

Tal has seen this scenario before in Israel. He is reminded of the Hula Valley where early pioneers forced "nature to bow to their demands" and drained the valley's swamps to make room for farms, upsetting nature's balance and creating unforeseen problems. More recently, "We took the waters that fed the Dead Sea to make the desert bloom and created Hebrew agriculture," he says. "But we killed the Dead Sea in the process."

Unlike the Hula Valley, the Dead Sea is not completely under Israeli jurisdiction, and the cause of its ills cannot be blamed on one nation alone. In a region known for its political tensions, possible

remedies are entangled with international complexities. So as experts, politicians and diplomats argue over its fate, little is being done to keep the Dead Sea alive. And doing nothing, warns Tal, is the worst alternative of all.

* * *

Carefully, gingerly, Raz guides me through an abandoned campground and spa area only a few yards from Highway 90, the main north-south road on the Israeli side of the Dead Sea. "Kibbutz Ein Gedi invested millions of shekels here," he says. "But eight years ago, one of the women working here was sucked into a sinkhole. She wasn't hurt, but we couldn't take a chance. We abandoned the site immediately; we couldn't even take out the equipment—the insurance companies wouldn't let us."

There are more than a dozen dangerously gaping sinkholes in this area alone. The beach cabanas have tipped over and collapsed. Once-lush greenery planted by kibbutz members has dried up; only a few intrepid Sodom Apple trees, with their delicate geometrically patterned flowers and strange, puffy, and poisonous fruits, hang on.

Signs in Hebrew, English, and Arabic warn to stay away and beware of sinkholes. Raz chuckles cynically. "How can you be careful? No one knows where the next one will open up." He points to one. "That's new," he says miserably. "This one wasn't here a week ago… It's only a matter of time until we have to leave this entire area."

Although no one has yet died in a sinkhole in Israel, there have been several serious injuries, and sinkholes are a direct threat to tourism, the main livelihood of the kibbutz and the entire Dead Sea region. Currently, tens of thousands of tourists visit every year, splashing in nearby freshwater pools, floating in the salty sea and slathering themselves with mineral-rich mud. Tourism makes up about 40 percent of the income of the half-dozen flourishing Jewish communities along the northern edge of the Dead Sea, most of them set up after Israel conquered this part of the West Bank in the Six Day War. Jordan is also investing heavily in tourism in the region, and the Palestinians have plans to develop hotels and health spas in their future state.

Sinkholes are also threatening agriculture—mostly date farming—in the region, another major source of revenue for kibbutzim, such as Ein Gedi. Raz points to a date orchard on the other side of Highway 90, also abandoned because of sinkholes. The trees still stand tall, but, without water, the sun has burned them black. "It's sad to see an abandoned orchard," says Raz.

The sea's receding waters have caused other problems. Unsightly mudflats now line the shore where water once lapped. Matthew Sperber, general manager of Kibbutz Almog, located on the shore's

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edge, points to the kibbutz's lucrative beach resort. Only five years ago, the kibbutz built carefully landscaped steps that led to the water's edge. But now the steps lead only to a dock to nowhere, hanging about three yards above and more than 13 yards from the shoreline. "We're trying to chase the water," Sperber says. "Eventually, we'll lose the race."

At the southern edge of the Dead Sea, five-star resorts and spas, such as Le Méridien and the Prima Hotel's Spa Club, are also at risk—of flooding. They are not far from mineral companies such as Israel Chemical's Dead Sea Works, where the potash extraction process creates an unwanted byproduct: Huge quantities of useless salt sink to the bottom of the evaporation ponds, causing water levels to rise. Several years ago, hotel owners on the Israeli side sued the Dead Sea Works and the Israeli government; as part of a settlement, the companies agreed to mine the salt to lower the water levels. The process, estimated to cost well over a billion dollars, is supposed to begin next year. But it's still not clear where the salt will be dumped.

If it dies, the Dead Sea will also kill its unique natural habitat. Although the water is barren of most life, the surrounding ecosystem includes springs that support a surprisingly rich range of flora and fauna. One such oasis is Einot Tzukim Nature Preserve—more often referred to by its Arabic name, Ein Feshkha, and also known as the "Concealed Preserve." Located in the West Bank and under Israeli control, it is open to the public only at pre-arranged times. Here, some 160 underground springs run down from the Judean hills and bubble up to the surface, forming sweet-water pools where fish swim quietly. Rushes and sugar cane wave in breezes cooled by the pools, which are ringed by tamarisk trees and other native plants.

Kingfishers, a sharp stripe of turquoise against the haze, dive for food. Ein Feshkha is a major migration path for birds through the Middle East; some half a billion birds pass through here each season, according to Ariel Meroz, a geology student at Hebrew University who works as a Parks Authority guide in the preserve. The birds are not alone. Numerous varieties of bugs and invertebrates have adapted to life here, and ibex, hyrax, wild boars, desert cats, hyenas, jackals, and wolves come to drink from the pools. Until recently there were leopards here too, as well as in the neighboring oasis of Ein Gedi. Most famously, the leopard of Ein Gedi—Shlomtzion, affectionately named for Jewish queen Salome Alexandra—prowled here for 16 years. Shlomtzion died in 1995, and no one has sighted a leopard since.

How can an environmental catastrophe be averted? One possibility under discussion is a massive public works project on a scale rarely seen on the international scene. This year, the World Bank presented a bold plan to replenish the Dead Sea with water from the Red Sea, south of Israel.

The idea of a canal linking the Dead Sea to either the Red Sea—known as the Red-Dead—or the Mediterranean—the Med-Dead—dates back to 1899, when Abraham Bourcart, a Swiss engineer and a Christian who enthusiastically supported the Zionist dream, suggested a Med-Dead canal to Theodor Herzl and the World Zionist leadership. The idea has surfaced numerous times over the years. In 1977, facing the oil crisis, the Israeli government even appointed an official committee to come up with operational plans. But nothing ever materialized.

The canal plan was resurrected at the 2002 Earth Summit in Johannesburg, South Africa, when Israel and Jordan announced—to the great surprise of many, including members of the Israeli government—that they would be turning to the World Bank to prepare a comprehensive report, including a feasibility study, an environmental study, and a social assessment, for a trilateral plan with the Palestinian Authority for a Red-Dead conduit.

The behind-the-scenes discussions that led to the announcement seemed to promise something for everyone. Jordan, with few freshwater resources and no oil to power desalination plants, had long been considering some form of Red-Dead conduit, even if it meant going it alone. Shimon Peres, now Israel's president but then its foreign minister, jumped at the opportunity for a large, high-tech, world-captivating cooperative project that would help extricate Israel from its uncomfortable international position and push the region into the "New Middle East." Palestinians wanted in as well; for them, participation in a project like this would mean world recognition of their status and their rights in the West Bank. And the idea apparently also appealed to James Wolfensohn, then President of the World Bank, who, a source close to him says, "has always had a deep personal hope to bring peace to the Middle East."

It took years to organize, raise the money and conduct the feasibility study, but the Red-Dead project as put forth in the 2013 World Bank proposal is both conceptually simple and astoundingly complex. It calls for annually pumping up to 528 billion gallons of water through 111 miles of tunnels and pipes on the Jordanian side from the Red Sea to the Dead Sea. Hydraulic stations would take advantage of the height differentials, and desalination plants would provide potable water for Jordan, the West Bank, and Israel, while the remaining briny water would be pumped back into the Dead Sea to raise its level.

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It would seem to be a win-win-win scenario, but environmentalists warn that the Red-Dead, rather than healing the Dead Sea, just might serve as its death knell. They are ringing an array of alarm bells: One is that mixing the waters could result in an algae bloom that might give the Dead Sea a reddish hue. Another is that a coat of white gypsum would form on the top. Although the ecological effects of these chemical changes are still unclear, they would likely diminish the sea's tourist appeal. A third concern is the high frequency of earthquakes in the region between the Red and Dead Seas: Seismic activity could cause salt water to leak into underground fresh water aquifers.

"Why not simply introduce water conservation, rather than a multibillion dollar pipeline project that will cause irreversible damage?" demands Gidon Bromberg, the Israeli head of Friends of the Earth Middle East (FoEME), a joint Israeli-Jordanian-Palestinian environmental group. But he acknowledges that this is easier said than done. Changing public behavior is a long-term process—and of little interest to most politicians. "They would much rather be seen cutting a ribbon over a grandiose plant than over a toilet that uses grey water," he says cynically.

Eli Raz doesn't like the plan either. He'd prefer to see the Dead Sea's problems solved by rehabilitating the Jordan River and utilizing desalination to supply a larger percentage of water to Israel's densely populated Mediterranean coast. But this would require a systemic, cooperative regional approach to water sharing—which is about as scarce as water in this part of the world.

The Israeli and Jordanian governments both officially support the Red-Dead. The Jordanians are so gung ho that they announced in August that they are pressing ahead with parts of the project on their own. The Palestinians, however, insist that they are being ignored and deprived of their rights. Water has been a source of ongoing conflict between Israel and the Palestinian Authority, since Israel controls the major renewable water resources throughout the West Bank. Although the Oslo Accords of 1995 provided for Palestinian access to water sources, the arrangements were never implemented by either side.

While the Palestinian Authority supports the Red-Dead in principle, it will not move forward unless a water desalination plant is constructed at Ein Feshkha, allowing the West Bank partial independence from Israel's water supply, according to an individual close to the Palestinian Water Authority, speaking on condition of anonymity,

The Palestinian demands are "not something that we are discussing," says Maya Eldar, an advisor to Israel's Regional Cooperation Minister Silvan Shalom. In fact, the Israelis can't even agree among

themselves. Shalom is a fervent supporter of the Red-Dead, while Environmental Protection Minister Amir Peretz just as fervently opposes it.

But even if environmental issues and diplomatic squabbles could be overcome, the cost of the Red-Dead—an estimated $15 billion to 17 billion—is prohibitive. According to the World Bank feasibility study, the economic viability of the project is dependent on international grants totaling $5 billion, and Jordan must raise an additional $2.5 billion in loans to pay for bringing the desalinated water 124 miles to Amman, which is 3,280 feet higher than the Dead Sea. Only then will the private sector kick in the remaining $2.6 billion. And after all that, the cost of the desalinated water in Jordan could be so high that it would have to be subsidized by the government.

Given the current world financial constraints, such funding is doubtful. Jordan's financial resources are strained by the thousands of refugees from the Syrian civil war fleeing into the country. In its current state, the Palestinian Authority is unlikely to receive grants or loans like this, and Israel certainly cannot pick up the tab—or even the loans—on its own

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"The Dead Sea Is Dying", Eetta Prince-Gibson, 17/09/2013, online at: http://www.slate.com/articles/news_and_politics/moment/2013/09/the_dead_sea_is_dying_how_sinkholes_habitat_destruction_and_low_water_levels.html

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❖ Desalinated water can augment water supply

The Israeli Ambassador to Ghana, Sharon Bar-li, says water desalination is key to having a sustainable water system in any country.

Water desalination is converting salt water so that it may be suitable for irrigation and pioneering cost-effective ways of providing fresh water for regions where its availability is limited.

She added that alongside an innovative and advanced approach to water management, there is a realisation that in order to bring about the oasis for the next generation, humankind needs to not only preserve the water it has, but in essence "create" more water.

"Creating more water can be done through rapidly advancing technologies of different sorts of purification and reclamation. Sanitation projects and sewerage water are the basis for renewable water for agriculture and industry," she said.

Citing the successes Israel has chalked up in turning the desert into an oasis, she said since Israel's foundation in 1948 it has placed great emphasis on maximising its water supply, famously turning much of its arid land into fertile agricultural soil.

"The Israeli water industry is recognised today as a global leader in the water arena, thanks to breakthrough technological innovations in areas such as desalination, drip-irrigation and water security.

"Today, the Hadera seawater reverse osmosis desalination plant in Israel is one of the largest of its kind in the world. Israel reclaims 75% of its reused effluents in agriculture," she noted.

Her Excellency Bar-li added that Israel's total water consumption has remained nearly the same since 1964, in spite of a growing population, industry and agriculture. "By the end of this year, desalination plants in Israel will supply more than 500 million cubic metres of water per year, supplying 35% of the country's fresh water needs."

She was speaking at a seminar held at the Movenpick Hotel in Accra ahead of the biennial water conference, WATEC Israel 2013, slated between the 22nd and 24th of October in Tel-Aviv.

The seminar presented some of the technologies, and demonstrated how they can meet some of Ghana's needs and challenges in the water sector. WATEC Israel is an international water technology and environment control exhibition and conference, taking place once every two years and bringing together Israeli and international business executives, political decision-makers and leading

researchers.

This year's conference will focus on Urban Water and Water for Industry, and will showcase most-advanced technologies and solutions from around the world. Alhaji Collins Dauda, the Minister of Water Resources, Works and Housing, in a speech read for him said government recognises the provision of accessible, reliable and equitable potable water as a basic human right.

Alhaji Dauda however said provision of sufficient and sustainable water for domestic and industrial purpose is fraught with many challenges. The challenges centre on rapid growth in settlements, growing sophisticated demands by water consumers, increasing environmental degradation, poor water resource management habits, falling sources of funding and investment.

He said with Israel's decades of rich and unique experience in the management of water resources, prioritising and packaging knowledge and technology would help exploit vast opportunities in the water sector.

"Desalinated water can augment water supply", 16/09/2013, online at: http://www.ghanaweb.com/GhanaHomePage/business/artikel.php?ID=285922

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❖ 'Ghana has water management problems'

Alhaji Collins Dauda, Minister of Water Resources, Works & Housing, says the provision of sufficient and sustainable water for domestic and industrial purpose is challenging.

The challenges, he mentioned, bother on rapid growth in settlements, growing sophisticated demands by water consumers, increasing environmental degradation, poor water resource management behavior, falling sources of funding and investment. Hon Dauda disclosed this at the opening ceremony of the Israeli water technologies seminar held in Accra recently.

According to him, given Israel's rich and unique experience in the management of water resource over the years, prioritizing and packaging knowledge and technology would help exploit vast opportunities in the water sector.

The Minister said it was time to look for practical solutions to the problems by ensuring efficient management and massive investment in relevant infrastructure through partnerships.

In that way, water sufficiency and availability, economic growth, poverty reduction and social equity towards national self-sufficiency would be guaranteed, he said.

Israeli Ambassador to Ghana, Sharon Bar-Li, in an address, said Israel was prepared to share its experiences in water management solutions with Ghana.

She called on Ghana's public sector to team up with private players to partner Israeli water companies to share best practices.

Noting that Ghana and Israel have been working closely on water and sanitation since the 1950s and 60s, she said Israel has the world's largest reverse osmosis desalination, water safety and recycles water of about 75 percent. She further said Israel boasts of one of the world's most advanced systems of waste water treat

'Ghana has water management problems', 16/09/2013, online at:
http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=285950

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❖ EU, Germany Provide €40M for Nablus Treatment Plant

RAMALLAH, September 18, 2013 (WAFA) - The Palestinian Authority (PA), the European Union (EU) and the German Government Wednesday signed a €40 million agreement to construct a wastewater treatment plant in East Nablus, according to an EU press release.

The large-scale project is funded through a €20 million contribution by the EU, a €21.8 million contribution by the German government as well as a €3.4 million contribution by Municipality of Nablus and will be implemented via the German KfW Development Bank.

The signing ceremony took place at the Prime Minister-designate Rami Hamdallah's office.

It was attended by John Gatt-Rutter, the EU Representative, Barbara Wolf, head of the German Representative Office in Ramallah, along with other Palestinian and German officials.

The new project is supposed to reduce health risks and pollution in East Nablus, whose wastewater flows untreated into the environment reaching agricultural areas and surrounding villages. It will also allow the re-use of treated wastewater in agriculture.

"Severe water shortages and acute water quality problems continue to negatively affect the lives and livelihoods of many Palestinians in the West Bank and Gaza," said Gatt-Rutter.

"In an effort to improve the situation, the EU has since 2011 included water and sanitation as priority sectors within its overall financial assistance to the Palestinian people. Today's ceremony marks the beginning of an ambitious project which can make a real difference to the quality of life of Palestinians in Nablus and the surrounding villages. It is also a clear example of how the EU works together with its member states to bring tangible results for the benefit of the Palestinian people," added the EU Representative.

Wolf said the improvement of the water and wastewater services is one of the core areas of support of the German Government in the Palestinian Territories.

"We are proud to have cooperated with the Palestinian side on the recently inaugurated Nablus West Wastewater Treatment Plant and look forward to continuing this partnership also at the eastern side of Nablus," she said.

"This project will benefit up to 150,000 people in the region and, through an effective collection and treatment of wastewater will protect water resources and reduce health risks," said Wolfgang Reuss, KfW Director of North Africa and Middle East.

The EU is a major actor in health and environmental protection in Palestine. Since 2008 it has invested nearly €90 million in the water and sanitation and solid waste management sectors.

In the West Bank, apart from Nablus, the EU is supporting the development of wastewater treatment plants also in other areas where water supply is scarce, such as Tubas.

In Gaza, the EU is investing both in large-scale solid waste management programs and also in medium-scale projects with high impact, such as the construction of a desalination facility that will provide safe water to thousands of Gazans.

The German Government currently implements projects worth more than €240 million for supporting the water and wastewater sector. Major projects include the al-Bireh, Nablus West and Gaza City wastewater treatment plants as well as technical assistance and capacity building to service providers and the Palestinian Water Authority (PWA).

"EU, Germany Provide €40M for Nablus Treatment Plant", 18/09/2013, online at: http://english.wafa.ps/index.php?action=detail&id=23224

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❖ Jordanian PM: Sell future desalinated water to Israel, purchase more Kinneret water

The Kingdom of Jordan intends to sell Israel water produced by a future Jordanian desalination plant, in return for the ability to purchase an increased amount of fresh water from Israel's Kinneret reservoir, Prime Minister Abdullah Ensour declared on Monday.

Ensour made the announcement at a press conference regarding the launch of the first phase of the Red Sea-Dead Sea Conduit project, which would consist of a desalination plant that is at least 100 million cu.m. in capacity. As part of an agreement with Israel, Jordan would sell its neighbor the desalinated water at 1 Dinar (NIS 5) per cubic meter and would purchase the Kinneret water at 0.3 Dinar (NIS 1.5) per cubic meter, Ensour explained.

Such a move would be ideal for Jordan because transferring the brunt of the water from the desalination plant near Aqaba to the country's water starved north would be much more expensive than embarking upon this plan, the prime minister stressed.

The $980 million desalination plant, slated to be situated in Jordan's south near Al-Risha, will draw water from the Red Sea's Gulf of Aqaba, Ensour explained. Once desalinated, the fresh water will once again return further south toward the city of Aqaba. A portion of the desalinated water as well as an additional 20 million cu.m. from the Al-Wehda Dam on the Jordanian-Syrian border has thus far been allocated for the country's densely populated northern governorates, Ensour said. The prime minister, however, is advocating the water swap with Israel in order to curb the costs associated with transferring the desalinated water to his nation's north. It is unclear whether he intends for the swap to occur in addition to or entirely instead of desalination transports to the north.

Overall, the Red Sea-Dead Sea Conduit project has been highly controversial among Israelis and Jordanians in Israel mainly due to environmental concerns and in Jordan mainly due to the extremely expensive cost of the project.

As the Dead Sea's water level has been declining at a rate of more than a meter per year, the project aims to save the sea from environmental degradation while desalinating water and generating hydroelectricity at affordable prices, a World Bank feasibility study said.

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According to project plans, an eastern intake site for sea water would be submerged off the coast of Aqaba, from which a combination of 180 km. worth of tunneling and pipelines would extend to the Dead Sea, with a desalination plant and two hydropower plants along the way all on Jordanian land. Plans had originally called for the desalination plant to have a capacity of 320 million cu.m., rising to 850 million cu.m. by 2060 .

Although the World Bank feasibility study released in January does overall deem the project to be possible as well as environmentally sound with some preventative measures, other World Bank assessments offered more severe warnings. One concern among experts includes the risk that the influx of seawater and brine into the Dead Sea will change both the appearance and quality of the water, and could negatively impact the region's ecology and hydrogeology. In addition, the report warned of the significant presence of nonrenewable energy that would be required to power the desalination plants.

Nonetheless, Water, Irrigation and Agriculture Minister Hazem Nasser described the Red Sea-Dead Sea Conduit project as a national program in Jordan's strategic interest, which the kingdom has "no choice" but to implement due to overall water scarcity. Meanwhile, Jordan's water shortage increases by 7 percent annually, Nasser added.

Water generated by the desalination plant would be sold to citizens at rates lower than water generated by the recently launched Disi Aquifer project, which now supplies Amman with an additional 100 million cu.m. of water from an ancient aquifer.

As far as the trade with Israel is concerned, Nasser explained that the two countries would not need to sign any new agreement, as the peace agreement of 1994 mandates that Israel sell to Jordan no less than 50 million cu.m. of water per year, an amount that can be redetermined. Currently, Israel provides Jordan with about 55 million cu.m. of water from Lake Kinneret each year, Nasser said.

In response to a query about the matter from *The Jerusalem Post*, Israeli Water Authority Spokesman Uri Schor said that "there are ongoing discussions all of time between the Jordanian and Israeli professional bodies, according to the peace agreement and the relationship between the two countries."

"Exchanges of ideas, requests and other things are taking place not through the press," Schor added.

Gidon Bromberg, Israeli director for the regional environmental organization Friends of the Earth Middle East, said that while his organization praises cross-border cooperation on and commerce of water, this is not the ideal path to take.

"FoEME welcomes creative ideas of water trade between Jordan and Israel and sees the potential environmental, economic and political benefits of exploring these options if done in a transparent manner," Bromberg told the *Post*.

"Linking trade in water Aqaba to Eilat and Kinneret to Amman with the Red-Dead project however makes no sense." Bromberg pointed specifically to one of the World Bank's secondary studies the Study of Alternatives which demonstrates how the Red Sea-Dead Sea Conduit could cause serious environmental ramifications. Instead, his organization champions a partial restoration of the Jordan River, another solution toward rehabilitating the Dead Sea discussed in the Study of Alternatives.

"Over a decade has been lost and tens of millions of dollars spent on the Red-Dead proposal with nothing but poor results environmental and economic," Bromberg said. "The public needs to call on our governments to move on, to deal with the root causes of the demise of the Dead Sea: charging the mineral extraction industry for the water they pump out of the Dead Sea and partially restoring the Jordan River."

"Jordanian PM: Sell future desalinated water to Israel, purchase more Kinneret water", 20/09/2013, online at: http://www.jpost.com/Enviro-Tech/Jordanian-PM-Sell-future-desalinated-water-to-Israel-purchase-more-Kinneret-water-323708

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❖ Water is One Key to a Peaceful World

What do Cochabamba, Bolivia, India's Deccan Plateau and Norcross, Ga., have in common?

They're all areas that have experienced water conflict. Whether it's due to privatization, climate change or state regulation, water is often a source of contention in both the developed and developing world.

For example, drought has played a significant role in fueling conflict in Syria, according to a recent **CNN blog**. A 2008 cable sent from Syria to institutions such as the United Nations and the League of Arab States underscored the dire situation and requested more than US$20 million of drought mitigation assistance. The Syrian agriculture minister warned that the political destruction and social instability caused by the drought would be beyond the country's capacity to cope.

While water may not always be the leading cause of conflict as it was in Cochabamba's fight against water privatization, it is often a contributing, and sometimes overlooked factor.

But water issues are also opportunities for cooperation towards a more peaceful world. With about 260 international river basins worldwide, scarce water resources are often shared by multiple states. The United Nations Development Programme stressed the importance of water cooperation in the post-2015 development agenda when the Millennium Development Goals give way to a new set of "**sustainable development goals**."

"Water is at the heart of a daily crisis faced by millions of the most vulnerable people in the world," said Associate Administrator of the UN Development Programme (UNDP) Rebeca Grynspan, in an **Aug. 21 UN News Centre article**. "Effective and inclusive water cooperation at all levels – local, national, regional, and international – is essential to effective water governance and thus to achieving key water-related objectives and targets."

One surprising example of water cooperation is taking place between Israel and Palestine. Spearheaded by the **Israel-Palestine Center for Research and Information**, work is underway to establish improved wastewaterinfrastructure that would positively impact shared aquifer resources.

Despite long-standing political tension, the need to address common water resource needs transcended political and ideological differences.

As September 21 marks the UN-dedicated **International Day of Peace**, a day which provides an opportunity for individuals, organizations and nations to create practical acts of peace on a shared date, Pure Water for the World joins with you in the hope of achieving a more peaceful world.

"Water is One Key to a Peaceful World", 20/09/2013, online at: http://www.trust.org/item/20130920151409-iw20c/

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❖ Warming will worsen water scarcity

Water scarcity is a fact of life in many parts of the world, particularly in the countries of sub-Saharan Africa. A new study says the situation could get a lot worse, with climate change resulting in less rain and more evaporation in many areas.

The study, led by researchers at the Potsdam Institute for Climate Impact and Research and appearing in the journal Environmental Research Letters, looks at present commitments by countries to reduce greenhouse gases (GHGs). It says that even if these commitments or pledges are met, the global mean temperature will still rise by around 3.5°C above pre-industrial levels by the end of the century.

This, according to the researchers' calculations, will expose 668 million people worldwide to new or aggravated water scarcity - that's in addition to the 1.3 billion people already at present living in water-scarce regions.

Using the same calculations, the study says that if the global mean temperature rises by only 2°C, at present the internationally agreed target maximum, an additional 486 million people - a figure equivalent to more than 7% of the world's present population - will be threatened with severe water scarcity.

Regions which will see the most significant deterioration in water supplies are the Middle East, North Africa, southern Europe and the south-west of the US.
Dr Dieter Gerten, the study's lead author, says the main factor leading to more water shortages will be declining precipitation: increasing temperatures will also lead to greater evapotranspiration - that is the sum of evaporation and plant transpiration from the Earth's land surface to the atmosphere.

"Even if the increase is restricted to 2°C above pre-industrial levels, many regions will have to adapt their water management and demand to a lower supply, especially since the population is expected to grow significantly in many of these regions," says Gerten.

Recognising the impacts

It's vital, says the study, that governments and policymakers, when setting targets on temperature rises, are fully informed of the overall consequences of their decisions.

"The unequal spatial pattern of exposure to climate change impacts sheds interesting light on the responsibility of high-emission countries and could have a bearing on both mitigation and adaption burden-sharing", says Gerten.

The Potsdam study used material from 19 different climate change models. This was run alongside eight different global warming trajectories. In all more than 150 climate change scenarios were

examined.

Researchers also examined the impact future changes in climate would have on the world's ecosystems, seeking to identify which areas would be subject to greatest change and whether these regions were rich in biodiversity.

"At a global warming of 2°C, notable ecosystem restructuring is likely for regions such as the tundra and some semi-arid regions", says Gerten.

"At global warming levels beyond 3°C, the area affected by significant ecosystem transformation would significantly increase and encroach into biodiversity-rich regions.

"Beyond a mean global warming of 4°C, we show with high confidence that biodiversity hotspots such as parts of the Amazon will be affected." - Climate News Network.

"Warming will worsen water scarcity", 16/09/2013, online at: http://bdnews24.com/environment/2013/09/16/warming-will-worsen-water-scarcity

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❖ Egypt-Sudan Ties Deteriorate Over Nile

CAIRO, Egypt — Relations between Cairo and Khartoum are headed down a dark road following the ouster of Egypt's Islamist President Mohammed Morsi, who had the backing of his Sudanese counterpart, Omar al-Bashir. This comes at a time when the Egyptian regime is striving to safeguard its security, commercial and water rights interests in Sudan.

An Egyptian Foreign Ministry source with knowledge about the Sudanese dossier explained to *Al-Monitor* the challenges in the relationship. "We are facing a crisis in trying to convince the Sudanese side of the sincerity of our stance, following Morsi's overthrow. We are keen on bolstering relations with the Sudanese government because doing so safeguards the water, food, and national security of Egypt," he said.

The source, who requested anonymity, said, "The Egyptian Ministry of Defense had put forth a plan to secure the Egyptian-Sudanese border, through the establishment of a joint border force between the two countries. In fact, some Egyptian security officials were dispatched to negotiate the details of the plan, but the Sudanese have yet to approve it."

Bashir's visit to Cairo in July was canceled, without any explanation given by the Egyptian presidency, despite preparations. But Egyptian Foreign Minister Nabil Fahmi headed to Khartoum on Aug. 18 on his first trip abroad, following the formation of the new Egyptian government. During his visit, Fahmi stressed Cairo's keenness to safeguard its national security, but he did not invite Bashir to visit Egypt.

Bashir, who is the subject of an arrest warrant issued by the International Criminal Court in March 2009 on charges of committing crimes against humanity in Darfur, tried to maintain close relations with the Egyptian revolution and the Islamist regime there, as evidenced by his four visits to Cairo in the last two years. These visits were described by the prominent Sudanese opposition figure, Hassan al-Turabi, as attempts to hide behind the revolution and the Islamist regime of Egypt, as well as to garner support for the legitimacy of his rule in Sudan.

"Four issues stand behind the undeclared crisis currently brewing between Cairo and Khartoum. These are: the conflict over the Hala'ib and Shalateen triangle; the problem of coordination and agreement about the Nile water dossier and the Ethiopian Renaissance dam; opening the border and giving the Sudanese freedom of movement, ownership in and entry into Egypt without the need for visas, as Sudan has done; in addition to control over border crossings, and opening the road between the two countries," an Egyptian security source told *Al-Monitor*, also on the condition of anonymity. The security source added that Cairo's refusal to open its border to the Sudanese came as a result of security considerations. The most important among the latter are the unstable security situation in Egypt and Sudan and the possibility that unsavory elements might sneak across the border from Sudan, particularly in light of Sudanese security forces' inability to secure most areas that suffer from armed conflicts and the proliferation of weapons. "The Sudanese side has conveyed to us its inability to guarantee the protection and security of the road between the two countries, if it were to be opened," the source added.

In this regard, the Egyptian and Sudanese governments had agreed to open the road that connects the two countries in September 2012. But implementation of the decision was postponed more than once for procedural and security reasons and it has yet to be inaugurated.

A diplomatic source connected with the ongoing negotiations with Sudan told *Al-Monitor*, "President Bashir always uses the Nile and the Hala'ib and Shalateen triangle issues to make demands and receive support from Cairo. This vexes Egyptian officials during negotiation sessions, and disagreements have disrupted the work of many joint committees between the two countries in matters of agriculture, commerce, and industry. It has also put on hold Egyptian projects in Sudan, most important of which is Egypt taking possession of the 1 million acres of land that Bashir had promised Egypt following the January revolution."

"Egypt strives to make the Hala'ib and Shalateen area the locus of economic and commercial symbiosis between Cairo and Khartoum. We absolutely do not want it to be a point of contention or conflict," Egypt's Ambassador to Sudan, Abdel Ghaffar al-Deeb, told *Al-Monitor*.

Sudan's actions in the Nile dossier also raise concerns in Cairo, which always strives to formulate a common position with Sudan — in its capacity as the other Nile basin downstream country — in opposition to the bloc formed by upstream countries. Khartoum has resumed its participation in the Nile Basin Initiative, despite its common stance with Egypt to freeze such activities, following the ratification of the Entebbe Convention by six of the Nile headwater states. Furthermore, the Khartoum government seems to be strongly leaning towards endorsing the building of the Ethiopian Renaissance dam, despite concerns by Cairo about the dam's impact on its water security, in addition to Bashir'sannouncement that Sudan intended to also build new dams.

"Meetings of the Egyptian-Sudanese Joint Technical Commission for Nile Waters have been on hold for the past year as a result of repeated requests for postponement by the Sudanese side. This is disrupting the attainment of an agreement for joint technical action in matters relating to Nile waters," an official at the Ministry of Water Resources and Irrigation told *Al-Monitor*.

The same source added that any discrepancies in coordinating with Sudan about the Nile basin crisis would harm the international legitimacy of Egypt's stance. It would also force Cairo to confront, by itself, the upstream countries, if it were to insist on the implementation of historical agreements that govern the management of Nile waters.

Despite the tensions that are affecting coordination between Egypt and Sudan on the Nile Basin issue, the Egyptian Minister of Water Resources and Irrigation, Mohammed Abdel Matlab, told *Al-Monitor*, "There are a number of ties that emphasize the strength of relations between Egypt and Sudan when it comes to the issue of the Nile waters. There is a permanent Egyptian mission in Khartoum to monitor the water level of the Nile in Sudan, and they are in constant contact with the Sudanese Irrigation Ministry to discuss water allocation and the division of annual quotas for Nile water." Matlab commented on the current dispute, saying, "What is happening is a difference in opinion, but our final position is unified, and we are always trying to reconcile views."

The new Egyptian administration is trying to take diplomatic steps aimed at containing the crisis with Sudan, to safeguard its interests without getting involved in a public debate or conflict with its

neighbor. But these attempts have not come to fruition, in light of the political instability that prevails in Egypt, and the continued conflict that wracks Sudan.

"Egypt-Sudan Ties Deteriorate Over Nile", 18/09/2013, online at: http://www.al-monitor.com/pulse/originals/2013/09/sudan-egypt-nile-basin.html

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❖ UAE to help resolve Egypt-Ethiopia row

The UAE and Saudi Arabia are preparing to go into bat to help resolve the dispute between Egypt and Ethiopia over a multi-billion dollar dam that has been constructed by the Ethiopian government on the so-called Blue Nile River — while an economic deal is being brokered.

The Egyptian Ministry of Irrigation made the announcement last week that the countries would lead dialogue between the warring factions over the dam that is being built in the area of the Nile River that borders Sudan and Ethiopia.

The $4.3-billion, 6,000-megawatt Grand Ethiopian Renaissance Dam, to be completed by 2017, has raised concerns in Egypt that accords which guarantee a certain amount of water for Egypt will be broken due to the dam reallocating water.

The Blue Nile River is the main tributary of the world's longest river.

Egyptian media reports quoted the high-level sources as saying the Arab Gulf Cooperation Council countries, except Qatar, were moving ahead towards setting up a mammoth economic project including Egypt, Sudan, the state of South Sudan and the AGCC states.

"Recently, a political agreement was concluded between the UAE, Saudi Arabia and Kuwait to benefit from the Egyptian and GCC political atmosphere to support the negotiation stand of Cairo with the Nile Basin Countries, especially under the GCC investments in these countries, which the sources estimated at more than US$20 billion. This will give the GCC's role weight in resolving the differences between Egypt and the Nile basin states in the next period," the sources said.

The sources were quoted by the Egyptian Arabic daily 'Al Misri Al Youm' as saying that the GCC stands serve as a vehicle for rapprochement between Egypt, Sudan and Ethiopia, and not a means for pressure, to achieve the economic interests for the region.

"The UAE and Saudi Arabia are working on charting out an initiative to solve the disputes between Egypt and Ethiopia over the The Grand Ethiopian Renaissance Dam (formerly known as the Millennium Dam)."

The colossal structure, sometimes referred to as Hidase Dam, is about 40 kilometres east of the border with Sudan.

"The GCC, except Qatar, are planning to set up a huge economic project including Egypt, Sudan and the state of South Sudan and the GCC to benefit from the relative feature of the Eastern Nile basin states in executing it, provided that the principles of the agreement for operating the Renaissance Dam after completion ensure no damage to the benefits of water for Egypt," the sources added.

"UAE to help resolve Egypt-Ethiopia row", 21/09/2013, online at: http://www.khaleejtimes.com/kt-article-display-1.asp?xfile=data/government/2013/September/government_September57.xml&section=government

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❖ Uzbekistan: Chronic Under-investment in Water Management

Residents of Angren, an industrial city in Uzbekistan, complain that the water supply is erratic and polluted. Water only comes out of the taps for a few hours a day, and even then it is often dirty and smells bad.

Problems with water provision in this city of 170,000 people, about 100 kilometres south of Uzbekistan's capital Tashkent, stem from years of under-investment in the local treatment plant. The poor state of the infrastructure has forced staff to cut corners just to keep any kind of supply going.

In Soviet times, Angren developed into an industrial centre, with engineering, construction materials and rubber factories all powered by the plentiful coal deposits in the area.

One resident, a pensioner who gave his name as Ilhom, described how householders stored up water in buckets and plastic containers whenever the taps were working.

"After we let the water settle, there's always dirt, mud or sand at the bottom. When it rains, the water coming out of the tap is brown and smells of clay," he said. "It's always been like that. What can we do about it?"

Daily power cuts interrupt the pumping of water through mains pipes, and this is compounded by numerous leaks in the network. A source at the city's hygiene and disease prevention agency told IWPR that perhaps 90 per cent of the mains network was in need of repair or replacement.

The situation is only made worse by people in villages near Angren tapping into the mains supply to divert water for their own use.

Officially, health experts say that problems with the supply are not a danger to human health. Angren's hospital refused to provide data on waterborne diseases, while the city hygiene agency said it had only recorded one case in the last five years, which involved people drawing contaminated water from a well rather than from the mains supply.

Doctors say that boiling tap water should ensure it is safe, and Angren's residents have been made aware of this.

One resident, Dilia, said her family allowed the sediment to sink to the bottom before drinking water from the tap, but did not boil it.

"Why would you need to boil it? It has been treated, hasn't it? It's normal water," she said.

Vodokanal, the state-run water utility, is short of funding both from central government and from consumers, who all too often do not pay their bills. That has left it unable to repair Angren's water treatment plant, install new equipment, and run tests for quality.

Angren's water is supposed to be purified by different means – ultraviolet light, chlorine or ozone – depending on what source it comes from. Water supplied to the city outskirts comes from underground sources and should be treated by ultraviolet light, but this does not happen.

Surface waters, meanwhile, are supposed to be treated with chlorine, and Vodokanal is supposed to add the chemical whenever the supply is cut off for more than two hours. But chlorine is in short supply so it is not used routinely. The exception is during the spring and autumn rainy seasons when there is more mud content, and in emergencies like the outbreak of waterborne diseases, when larger-than-normal amounts are added.

At such times, the public is supposed to be notified of the high levels of chlorine in the drinking water. Again, however, this does not happen as the authorities have not found a way of making public announcements since the local TV station closed due to lack of funding.

One apartment block resident said he was unaware of any risks posed by high chlorine levels.

"It does sometimes happen that the tap water has a strong smell of chlorine. We've never thought there was anything bad about that," he said.

When city officials were approached for comment, they said they knew the quality of drinking water was less than ideal and that the treatment system was in need of repair.

People living in towns and villages downstream of Angren, meanwhile, face additional risks from inadequate treatment of the effluents produced by this large industrialised urban centre, running into the river Ahangeran.

Vodokanal is responsible for sewage as well as the water supply, and one former employee said that staff there were required to fabricate figures to avoid fines for polluting the river with ammonia and excrement.

He recalled cases when colleagues used various excuses so as to avoid carrying out the tests requested by the State Committee for Environmental Protection because they knew they would fail.

"We were in position to carry them out, but we didn't," he said.

The environment protection committee is in an unenviable position as it lacks the resources to act as a powerful watchdog. It is so short of money that it has to ask Vodokanal for the use of lab equipment and other help to carry out the tests.

"Uzbekistan: Chronic Under-investment in Water Management", 17/09/2013, online at: http://groundreport.com/uzbekistan-chronic-under-investment-in-water-management/

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❖ Consensus must on dams'

KARACHI: Provinces need to reach consensus for the construction of mega dams to improve water security and address power crisis.

This was the take home message for the participants at a seminar titled 'Our Life, Our Sindhu River', held under the aegis of the Sindh Abhyas Academy (SAA) at Shaheed Zulfikar Ali Bhutto Institute of Science and Technology (SZABIST) on Tuesday.

According to Federal Flood Commission estimates the country loses out Rs240 billion worth revenue as it does not have the capacity to store 40 million acre-feet (MAF) of flood water which ends up in the Arabian Sea.

Director SAA at SZABIST Dr Ghazala Rahman Rafiq introduced the speakers including water expert and former chairman of the Technical Committee on Water Resources, AGN Abbasi and irrigation system expert, Idrees Rajput.

The two gentlemen gave an interesting, albeit a conflicting insight into the issue of building large-scale dams.

"After the Water Apportionments Accord (WAA) 1991, Sindh has been receiving less than its share of water. As a result, the Indus delta is suffering due to inadequate fresh water inflow and less nutrient rich silt. If the proper quantum of water to the delta is not maintained, it will die," Rajput warned.

Giving a rundown of the possible dams in Pakistan, he said: "Due to logistical, defence and economic viability issues, Katzara Dam in Skardu and Akhori Dam are not feasible. So far there is no progress on the Diamer-Bhasha dam, which if constructed would offer a storage capacity of 6.4 MAF and 4500MW of power. Kalabagh Dam will offer a storage capacity of 6.1MAF and 2400MW power but it has become a controversial topic."

Answering a question as to why a dam needs to be built in Kalabagh, he said: "You need mountains and a rock bed so that there is little seepage of water. In Sindh, there is no such potential site. The only place in Pakistan is Kalabagh in Punjab."

He opined that the lack of trust made Kalabagh Dam controversial.

On the subject of why new dams are needed in the country, he said that the storage capacity of the Tarbela and Mangla dams was down by 29 per cent and 15pc respectively, due to silting. "Water stored in Kharif is consumed in ensuing Rabi and no water remains for early Kharif."

He was of the opinion that both Bhasha and Kalabagh dams were the need of the hour.

AGN Abbasi spoke at length about the wrongs that Kalabagh Dam would aggravate.

"The Indus Water treaty of 1960 was 'mediated by the World Bank. That is the first time when Sindh's share was taken away from it. The mediators were unfair when they brokered this dead. They should have at least assessed the impact of the deal on Sindh which continue to suffer," he said.

Explaining the 1960 treaty to the audience that mostly consisted of young students, the elder gentleman said that some 33MAF water was 'handed over to India on a platter' while the neighbour has also been allowed to develop over a million acres of irrigated land without any restrictions.

"Kalabagh Dam is not in the interest of the country. Its feasibility study of was carried out in 1984 and is useless in 2013."

Stressing that the people in Pakistan were becoming apathetic towards the plight of Sindh and Indus, he summed up: "Bhasha was to begin in 2006 and be completed by 2013. Sadly this did not happen. Bhasha offers a middle ground that is important for Sindh."

"Consensus must on dams'", 18/09/2013, online at: **http://dawn.com/news/1043631/consensus-must-on-dams**

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❖ Locals oppose mega-dam construction in Khaishi

A public debate over the fate of the Khudoni dam in Khaishi, a high mountainous region in west Georgia's Svaneti region, remains tense. On September 17, as a public hearing on the issue was in progress, villagers in Khaishi turned out in significant numbers to the hearing to express their harsh opposition to the mega-dam project.

Environmentalists complain that locals opposing the project have been intimidated by authorities and the project developer, Transelecrica Ltd.

"Bankwatch representatives in Khaishi today were told how one day before the consultations, the deputy head of the regional police department and the Transelectrica director present in the village warned locals not to put up posters critical of the project or protest against it," a press statement released on Tuesday jointly by Bankwatch, Central and Eastern European network for monitoring the activities of international financial institutions and Green Alternative Georgia, Tbilisi based environmental NGO, stated.

According to the statement, before the consultations began on September 17, an unprecedented police presence was visible in front of the municipality building where the debate took place.

Transelectrica, an international company created to invest in Georgia's energy sector and registered in the Virgin Islands, bought the land where the Svan homes are located for $1 from the Georgian government.

"The company and authorities here are working too closely together for locals not to suspect some wrongdoing," commented Dato Chipashvili, a Bankwatch Georgian campaigner. "People were not allowed by officials to register their land, which made it easier for the company to purchase it for $1. This and the fact that apart from the tax money, and there are no real benefits from this dam project, this makes us all suspect that corruption is involved."

A Public hearing on Tuesday was part of the environmental and social impact assessment procedure that must be completed before the 700 megawatt, $1.2 billion project can be implemented. Georgia's Deputy Energy Minister, Ilia Eloshvilli, Transelectrica representatives, and locals from Khaishi, attended the hearing.

The Khudoni dam project is one of over 40 hydro-power plant projects shaping-up in Georgia today. Authorities argue that the country needs more dams to meet domestic electricity needs, even though the country is already a net exporter of electricity.

"We need hydro-power plants for strategic purposes and we have to understand this very well. Energy-independence will be the fundamental basis for our independence," President of Georgia, Mikheil Saakashvili said while addressing the local population in Shuakhevi, in Adjara on September 16. "We should manage to construct as many HPPs as possible. Tomorrow, the issue of Khudoni dam will be discussed and I call for the Svan people to be patient and show understanding," he added.

The Construction of the Khudoni dam has invited much criticism from environmentalists and human rights groups. Over 2,000 indigenous Svans would be displaced if the project goes ahead.

Georgia's greens believe that instead of supporting mega projects, Georgia should opt for the construction of local, micro power plants that are capable of generating cheap electricity to power the local community. "The Khudoni dam is not needed in Georgia, it would only profit the companies that will export the electricity," Chipashvili says.

The Khudoni dam was designed by the Soviet Union and construction began in 1979. Fierce protests by locals and members of the pro-independence movement convinced authorities to halt the construction work in 1989. However, successive post-Soviet Georgian governments once again began looking for investors for the Khudoni project.

In 2005, the World Bank approved a technical assistance grant for Khudoni to prepare to host the preliminary studies, environmental impact assessments and a resettlement action plan, which further stimulated the Georgian government to proceed with the project

"Locals oppose mega-dam construction in Khaishi", 19/09/2013, online at:
http://www.georgiatoday.ge/article_details.php?id=11475

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❖ Opening the floodgates - The great rivers of China are being dammed, regardless of the consequences

CHINA has many good reasons not to build the $5.2 billion Xiaonanhai dam on the Yangzi river in Chongqing. The site, on a gentle slope that moves water along only slowly, is not ideal for generating hydropower. The fertile soil makes it one of China's most productive regions, so it is densely populated with farmers reaping good harvests. And the dam (see map), which would produce only 10% of the electricity of the Three Gorges project downstream, could destroy a rare fish preserve, threatening several endangered species including the Yangzi sturgeon.

Yet it does not matter how strong the case may be against Xiaonanhai, because the battle against a hydropower scheme in China is usually lost before it is fought. The political economy of dam-building is rigged. Though the Chinese authorities have made much progress in evaluating the social and environmental impact of dams, the emphasis is still on building them, even when mitigating the damage would be hard. Critics have called it the "hydro-industrial complex": China has armies of water engineers (including Hu Jintao, the former president) and at least 300 gigawatts of untapped hydroelectric potential. China's total generating capacity in 2012 was 1,145GW, of which 758GW came from coal-burning plants.

An important motive for China to pursue hydropower is, ironically, the environment. China desperately needs to expand its energy supply while reducing its dependence on carbon-based fuels, especially coal. The government wants 15% of power consumption to come from clean or renewable sources by 2020, up from 9% now. Hydropower is essential for achieving that goal, as is nuclear power. "Hydro, including large hydro in China, is seen as green," says Darrin Magee, an expert on Chinese dams at Hobart and William Smith Colleges in New York state.

There is also a political reason why large hydro schemes continue to go ahead. Dambuilders and local governments have almost unlimited power to plan and approve projects, whereas environmental officials have almost no power to stop them.

Heavy on the levees

The problems begin with the planning for China's rivers, which are divided into fiefs by the state-owned power companies that build dams in much the same way as the Corps of Engineers and the Bureau of Reclamation divided up American rivers in the early 20th century. Though the staff of the water-resources ministry in Beijing know a lot about the environment, they have no say. "Big hydro projects are designed and approved by everybody but the ministry of water resources," says Mr Magee.

Local governments, meanwhile, view dams as enticing economic development projects. The dambuilders, which have special privileges to borrow, put up the financing. The extra electricity supports industrial expansion and brings in revenues. Local officials are promoted for meeting economic performance targets and some collude for personal gain with the dambuilders. Because of the decentralised nature of the industry, local officials try to include dams in their plans. Once they have done so, they can expect the environmental impact assessments that follow to be a formality—if only because the consultants who undertake them are paid by the hydropower companies.

Environmental officials who have not been financially captured by the dambuilding economy find themselves as scarce as some of the fish they are charged to protect. Environmental activists, meanwhile, can request access to public records and demand public hearings, both required by law. But they say that these avenues are barred when they are most needed—on controversial projects that face vocal opposition. For example, the authorities have rejected requests for public records on Xiaonanhai and they have not granted a public hearing.

If environmental regulators and activists want any hope of halting a project, they must go outside normal bureaucratic channels to lobby powerful Politburo members or the national media. Although that may not always work, it did in 2004, when Wen Jiabao, then prime minister, halted construction of a cascade of 13 dams on the Nu River in south-west China in order to protect the environment. Even then some work on the projects still proceeded. Meanwhile, smaller schemes race ahead unchecked. Promoted by dambuilders and local governments, nearly 100 smaller hydroelectric projects in the Nu river region went forward without needing permission from higher up. Some began before they had even received the final approval.

China's new leaders in recent months have signalled that they want yet more dams, approving several ambitious new projects, including what would be the highest dam in the world, on the Dadu river. After Mr Wen stepped down from his posts in the party and the government, the dams on the Nu river that he blocked received the go-ahead again.

Chinese leaders have for millennia sought to tame the country's great rivers, which have sustained and destroyed countless lives with cycles of abundance, famine and floods. Indeed their legitimacy as rulers has long been linked to their ability to do so. The Communist Party has built thousands of large dams since 1949. China is also the world's leading builder of big dams abroad; International Rivers, a pressure group, says that Chinese companies and financiers are involved in about 300 dam projects in 66 countries.

The most controversial emblem of Chinese hydropower is the Three Gorges dam, the largest in the world with a capacity of 22.5GW. In contrast, America's Hoover Dam has less than one-tenth of that capacity. Many critics within China felt that the Three Gorges was too big and too dangerous to build. They predicted that silt would collect in its reservoir, threatening the stability of the dam and lessening its capacity to produce power. They warned that the dam's vast reservoir, which would submerge the homes of more than 1m people, would become polluted and alter the flow and ecology of the Yangzi river. They also feared that the dam could cause earthquakes, as it sits on two major fault-lines.

Damn the consequences

In the end, though, political power trumped scientific argument. Nearly one-third of China's legislature either abstained or voted against the Three Gorges dam in 1992, in what remains the most vocal opposition the rubber-stamp body has ever registered against a proposal from China's leaders. But Li Peng, then prime minister, had trained as a hydroelectric engineer and was determined to build the dam. (His daughter, Li Xiaolin, is head of a publicly listed arm of one of the five big state-owned power companies.)

Today authorities acknowledge that many of the predictions about the Three Gorges dam have come true. This has led to them proposing mitigation strategies, including building more dams upstream,

such as Xiaonanhai, to slow the accumulation of silt. The state has also passed numerous laws and regulations in an attempt to balance dam construction with the protection of China's rivers.

The Xiaonanhai dam, though, suggests that they are treading the same old path. First put forward in 1990, it was in recent years pushed hard by Bo Xilai, a member of China's Politburo who was sacked as Chongqing's party chief in March 2012 and tried last month. The dam, nevertheless, had its official groundbreaking ceremony just days after his downfall. China Three Gorges Corp, which is in charge of this section of the Yangzi river, has begun minor preparatory work on the dam; residents have been approached about resettlement; and last year Chongqing officials listed Xiaonanhai as a "major project" for 2013, making its construction almost a certainty, regardless of the environmental impact assessment when it comes.

Environmental activists are left to accept that hydropower will continue to transform all the big rivers of China. They argue that Xiaonanhai is not a "smart" dam even from the perspective of the power companies. For a large dam, it will not produce much electricity. And it is not ideally positioned to alleviate the silt build-up in the Three Gorges reservoir downstream—in part because so many other planned dams farther upstream will do the job, instead.

Guo Qiaoyu of The Nature Conservancy, an American environmental group, argues that Chongqing would do better to increase the power-generating capacity of existing dam projects in the region. A planned cascade of 12 dams along the lower Jinsha river nearby will produce almost 30 times as much electricity as the Xiaonanhai dam. About 90 other significant dams are planned in the region.

Fan Xiao, a Chinese environmental scholar and activist, argues that the dam will also destroy prime farmland that Chongqing needs to feed its 32m people. In a letter in 2011 to national leaders he called the area around Xiaonanhai "the most productive…concentration of arable land along the banks of the Yangzi river".

Indeed, Liao Rengang, a farmer of tomatoes, cucumbers and peppers beside the Yangzi, says he earned more than 130,000 yuan ($21,000) last year. But Mr Liao says he will not bother fighting the dam: "If they want to take the land they can, because they are the state," he says. "It's not up to us."

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"Opening the floodgates", 21/09/2013, online at: **http://www.economist.com/news/china/21586538-great-rivers-china-are-being-dammed-regardless-consequences-opening-floodgates**

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❖ Judge halts construction of Amazon dam on Brazil's Teles Pires river

A federal judge in Brazil has ordered the suspension of construction activities on the Teles Pires due to shortcomings in the environmental licensing process, including the project's impacts on three local tribes, reports International Rivers.

Federal judge Antônio Souza Prudente's ruling came last week in response to a civil suit filed by Brazil's Federal Public Prosecutors' Office, which cited errors in the project's environmental impact assessment (EIA). A statement from International Rivers explains:

According to the lawsuit, the Energy Research Enterprise (Empresa de Pesquisa Energetica, or EPE) linked to the Brazilian government's Ministry of Mines and Energy committed a series of gross errors regarding a required "indigenous component" of the environmental impact assessment (EIA). Initially, EPE attempted to use the EIA for two other planned dams on the same river – São Manoel and Foz de Apiacás – as a proxy for analyzing impacts of the Teles Pires Dam. When a draft version of the indigenous component for the Teles Pires Dam was finally presented over a year after the rest of the EIA was completed, technical staff at FUNAI (the federal agency for indigenous affairs) flagged major shortfalls in the study, especially in terms of downstream impacts on water quality, fisheries and destruction of Sete Quedas, a series of rapids and waterfalls with tremendous cultural, religious and archeological importance for the Kayabi, Apiaka and Munduruku indigenous people.

International Rivers notes that the final version of the indigenous component of the EIA has yet to be approved by FUNAI.

Under the court ruling, Teles Pires Hydroelectric Company faces up to 500,000 Brazilian reais ($228,500) in fines for each day that it fails to comply with the order.

The Teles Pires Dam is one of five large dams planned for the Teles Pires River, a major tributary of the Tapajós River. With installed capacity of 1,820 MW, the dam would be Brazil's second largest hydroelectic project, after the Belo Monte dam on the Xingu river. Brazil is planning to build scores of dams across the Amazon Basin by the end of the decade. Ecologists warn the activity could alter nutrient flows through Earth's largest rainforest, while blocking fish migration routes and flooding large areas of forest.

"Judge halts construction of Amazon dam on Brazil's Teles Pires river", 19/09/2013, online at: http://news.mongabay.com/2013/0919-teles-pires-dam.html

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