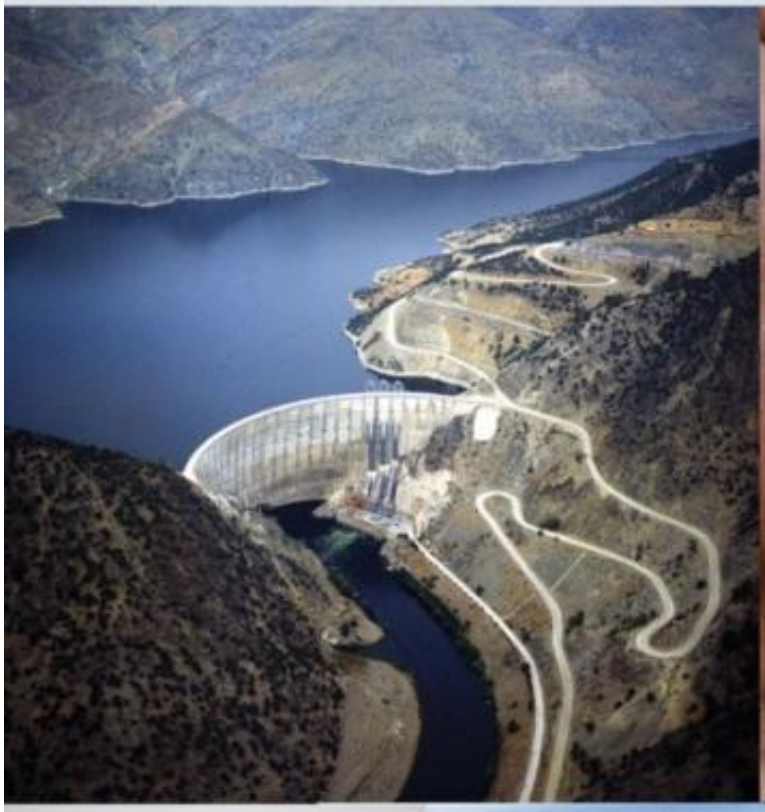


ORSAM WATER BULLETIN

Weekly Bulletin by ORSAM Water Research Programme

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





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Mithat Paşa Caddesi 46/4 Kızılay-Ankara TURKEY
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- **WASSER Berlin 2013 Focuses on the Middle East**
- **Smart ways to save water**
- **Groundwater dropping globally**
- **Finally – A Team of Experts to Evaluate Impact of Massive Ethiopian Dam**

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❖ Turkey Launches Efforts to Drill Water Well in Somalia

MOGADISHU (A.A) - Turkey's State Water Works Agency (DSI) launched on Wednesday efforts to drill a water well in Somalia.

Seven-member DSI team, headed by geologist Musa Yilmaz, started to drill a water well near a Turkish Red Crescent tent-site in the Somali capital of Mogadishu.

DSI experts said they would drill up to 100 meters below the ground to reach potable water, adding that they expected to complete the project within a week.

Somalia is facing with one of the worst droughts in the past 60 years.

The epicenter of the drought lies on the three-way border shared by Kenya, Ethiopia and Somalia, a nomadic region where families heavily depend on the health of their livestock. Uganda and Djibouti have also been hit by the disaster.

Tens of thousands of people have so far been displaced due to the humanitarian situation in the region.

"Turkey Launches Efforts to Drill Water Well in Somalia", 28/12/2011, online at:
http://www.turkishweekly.net/news/128899/turkey-launches-efforts-to-drill-water-well-in-somalia.html

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❖ Iran to invest USD 571 million in Armenian electricity projects

Mehr News Agency reported that an Iranian private sector consortium will invest USD 571 million in two projects in Armenia for commissioning the third power transmission line from Armenia to Iran and boosting the Aras River hydroelectric power plant capacity to 1.7 giga watts per year.

Iranian energy minister Mr Majid Namjou, who heads Iran Armenia Joint Economic Commission, said that Iran will establish a pipeline to transfer gas to Armenia and, in return, will import electricity from the neighboring country.

The agreement followed President Mr Mahmoud Ahmadinejad's visit to Armenia in which five cooperation agreements and memorandums of understanding were signed between the two neighbors.

Building and operating hydroelectric power plants on Aras River which runs along the two countries' border, cooperation between national standards institutes of the two sides, cooperation in the social welfare sector, and cooperation in the field of environment protection were among the agreements.

Mr Namjou also said that "Iran and Armenia have had good relations since the past and this relation is still on the rise."

In similar remarks, foreign minister Mr Ali Akbar Salehi said that Iran Armenia relations are very special.

Mr Salehi also said that Iran and Armenia are preparing the ground for signing a free trade agreement.

"Iran to invest USD 571 million in Armenian electricity projects", 28/12/2011, online at: http://www.steelguru.com/middle_east_news/Iran_to_invest_USD_571_million_in_Armenian_electricity_projects/243102.html

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❖ Zayanderud, largest river on the central Iranian plateau

Zayanderud or Zayandeh River crosses the city of Isfahan, a major cultural and economic center of Iran. It is the largest river on the central Iranian plateau, flowing from west to east, and the most well known river of Iran after Karoon.

A hypothetical pre-historic culture is theorized to have flourished around the Zayandeh River in Iran in the 6th millennium BC. Archaeologists speculate that a possible early civilization existed along the banks of the Zayandeh River, developing at the same time as other ancient civilizations appeared alongside rivers in the region, such as the Sumerian civilization in Iraq and the Indus Valley civilization in ancient India. Archeological excavations in the Zayandeh River basin unearthed a 50,000 year old cave containing human and animal remains.

Zayandeh River starts in the Zagros Mountains and travels 400 kilometers eastward before ending in a seasonal salt lake, southeast of Isfahan city.
The Zayandeh is spanned by many historical Safavid era (1501 to 1722) bridges, and flows through many parks.
In the 17th century, Shaikh Bahai, an influential scholar and adviser to Safavid dynasty, designed and built a system of canals to distribute Zayandeh River water to Isfahan's suburbs. Water from the Zayandeh River helped the growth of the population and the economy, helped established Isfahan as an influential center, and gave a green landscape to Isfahan, a city in the middle of a desert.
Until the 1960s in Isfahan Province the distribution of water followed a document claimed to date from the 16th Century. It divided the flow of the Zayandeh River into 33 parts which were then specifically allotted to the eight major districts within the region. At the district level the water flow was divided either on a time basis, or by the use of variable weirs, so that the proportion could be maintained regardless of the height of the flow.

For centuries Isfahan had been an oasis settlement, noted for its surrounding fertile lands and prosperity. Until the 1960s industrial demand for water were minimal, which enabled the scarce water resources to be utilized entirely for agricultural production. With a growing population within the basin, creation of large steel works and other new industries and rising standards of living particularly within the city, the pressure on water resources steadily increased until the division of water was no longer feasible.
The Chadegan Reservoir dam project in 1972 was a major hydroelectric project to help with stabilizing water flow and to provide generation of electricity. Since 1972, the Chadegan Reservoir has helped prevent seasonal flooding of the Zayandeh River. There have been a number of tunnel projects to redirect water from the Karoon River to the Zayandeh. These have helped provide water for the growing population and new industries in both Isfahan and Yazd provinces.

In the section of the Zayandeh River crossing Isfahan, bridges, parks, paddle boats and traditional cafes and restaurants amongst the rest of Isfahan rich cultural heritage, are major tourist attractions for Iranian as well as international visitors. There are several new and old bridges over the Zayandeh River. Some of the bridges on Zayandeh River in Isfahan are as follows:

Shahrestan Bridge – Believed to have been built during the Sassanid era (226-651).

One of the oldest bridges on Zayandeh River it bears much resemblance to Dezful and Shushtar Bridges, also from the Sassanid era.

Marnan Bridge - Built in 1599 and measures 160 meters long. It was formerly known as Sar Afraz Bridge, however, being a connection to Marnan Village it eventually adopted this name. It was built by a rich member of the Armenian community of the Safavid era.

Si-o-Seh Bridge - Built in 1632 it is the longest, and one of the most famous bridges of Zayandeh River. It is also knows as Alahverdi Khan Bridge. Throughout history traditional Abrizan festivities took place at this bridge.

Khaju Bridge - Built in 1650, it is as well known as 33 Pol. It was frequently decorated and used for various celebrations.

Choobi Bridge – Believed to have been built in the 17th century, it used to be an exclusively utilized bridge connecting Haft Dast Building to Sa'adat Abad Garden.

As of late and as a result of climate changes, Zayandeh River has become seasonal. Unlike many of Iran's rivers it normally had significant flow all year long. However, the severe draught caused the river to completely dry up. Fortunately, early in this fall water started flowing into the river again, bringing it back to life.

"Zayanderud, largest river on the central Iranian plateau", 26/12/2011, online at: http://tehrantimes.com/highlights/93899-zayanderud-largest-river-on-the-central-iranian-plateau/

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❖ Agthia buys Turkish bottled water producer

Dubai : Abu Dhabi state-backed food and beverage company Agthia Group has acquired Turkish spring water producer Pelit Su in a deal signed yesterday, the UAE company announced.

The transaction is expected to close during the first half of 2012, Agthia said in a statement yesterday. The value of the deal will remain undisclosed until the transaction is closed next year, the company's public relations officer said.

"Agthia's acquisition of Pelit Su is in line with our geographic expansion strategy," said Rashed Mubarak Al Hajeri, Chairman of Agthia Group.

Acquisition of the company in Adana in southern Turkey gives Agthia access to spring water originating from the Toros Mountains.

"The acquisition of Pelit Su, Turkey, will mark our second international expansion, reinforcing our mission to deliver superior value to our stakeholders. The venture will provide access to high quality spring water facilitating Agthia's growth into higher margin premium spring bottled water, targeting not only Turkey and the UAE but the wider GCC and beyond," said Ilias Assimakopoulos, Agthia group chief executive.

The deal gives Agthia an existing manufacturing plant with three bottling lines and additional space for potential capacity expansion over 23,000 square metres of land.

"The company has demonstrated a healthy performance and has successfully provided quality pure spring water to the region," said Murat Pelit, Chairman of Pelit Su, a family-owned business.

The acquisition comes amid a flurry of food investments by the UAE in agricultural countries when sharp commodity prices this year raised food security concerns. Agthia recently teamed up with French yoghurt-maker Yoplait and invested $13 million (Dh47.74 million) in a new plant to produce a specific selection from the Yoplait range.

"We have grown significantly in the last four to five years — we are in dairy and juices and this year moved into fresh juices as well," said Fasahat Beg, general manager of Agthia's consumer business division, in earlier comments. "We are a leader in [bottled] water. We have been pretty deliberate in the way we have gone about securing our presence in new categories. The intention is to create synergies rather than cannibalising any of the existing products. It has worked well for us."

The UAE is leading the region in merger and acquisition deals according to an Ernst and Young report.

The number of merger and acquisition deals in the Middle East and North Africa (Mena) increased 43 per cent to 96 in the second quarter of 2011 over the same period last year, according to the report.

"Agthia buys Turkish bottled water producer", 26/12/2011, online at: http://gulfnews.com/business/investment/agthia-buys-turkish-bottled-water-producer-1.956963

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❖ Turkey re-opens Heizel River - Foreign Ministry

BAGHDAD / Aswat al-Iraq: The Iraqi Foreign Ministry announced today that Turkey has re-opened the flow of the Heizel River into Iraqi territories, following a three week cut-off.

In a statement released by the Foreign Ministry, it was announced that through the efforts of the ministry and continued notes and meetings with the Turkish Embassy in Baghdad, and border meetings, the waters of the river were flown.

The statement added that the Foreign Ministry insisted on the water flow to strengthen bilateral relations between the two countries.

"Turkey re-opens Heizel River - Foreign Ministry", 28/12/2011, online at: http://en.aswataliraq.info/%28S%284e3gbb45qleyk2e2cnc5yz45%29%29/Default1.aspx?page=article_page&id=146243&l=1

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❖ NGOs in Duhok protest blocking of river by Turkey

DUHOK, Dec. 26 (AKnews) – Turkey has cut off the flow of water from the Hizl River that flows into Kurdistan Region prompting organizations in Duhok Governorate to raise a protest letter to the Baghdad Council of Representatives to press Turkey to release the water.

The river flow has been cut for most of this month.

Hizl source lies in Turkey and it flows through Kurdish land to Duhok Governorate from where it feeds the Tigris River. Stopping the water has affected villages along the banks of the river, their plantations and is expected to affect the level of water in the Tigris River as well.

Several organizations in Duhok handed a letter of protest to the Council's Duhok office on Monday calling for an immediate release of the river.

Abdullah Barbiri, an activist from the Duhok-based Water Organization that promotes awareness about the use of water, told AKnews that the blocking of the river has affected at least 10 villages.

"It has affected the orchards, plantations and farms in those villages around Zakho. It has affected the level of water in the Khabur River, and it is also expected to affect the level of Tigris River," he said.

Hamid Bavi, Duhok's Council Representative said Kurdish Blocs Coalition – Bavi's parliamentary blocs – has been probing the issue and will take the issue to the parliament.

Earlier Mohammed Amin Pendruyi, Director of Water Resources, told AKnews that local officials had contacted the Iraqi Foreign Ministry about the issue and they said a meeting is due to discuss the issue and find out the reason why Turkey had cut the river.

"NGOs in Duhok protest blocking of river by Turkey", 26/12/2011, online at:
http://www.aknews.com/en/aknews/3/280566/

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❖ 12 dams to save 20 billion cubic meters of water

SULAIMANIYAH, Dec. 28 (AKnews) – Authorities in Kurdistan Region are planning to build 12dams in the semi-autonomous region in an attempt to save about 20 billion cubic meters of water per year.

Currently, there are three main dams in Kurdistan Region, two in Sulaimaniya province, and one in Duhok province. But these save only 30% of the total amount of water that flows from Kurdistan Region.

"Due to lack of big dams, 20 billion cubic meters of water, that's 70% of Kurdistan Region's water is wasted and cannot be used in an appropriate way" said Akram Ahmed, Director of Reservoirs and Dams in the region.

"We have been able so far to save only 10% of the water for use in the areas of agriculture, drinking and other areas" he said, "therefore, we have set plans to address this issue of wasting water and that's by building 12 dams in the various areas of Kurdistan Region"

Among these 12 dams, four will be built in Erbil province, and one in Sulaimaniyah and Kirkuk each.

These dams are currently either under construction, while 27 more are in the early stages of designing, says Ahmed.

The budgets for the implementation of some of the 27 dams is ready, he said, "And the authorities I the ministry of planning have promised to work on allocation of budgets for more dams"

Upon the completion, the dams could save more water from being wasted, which could be used in agriculture, fish projects, power generation, and tourism.

"12 dams to save 20 billion cubic meters of water", Ak News, 28/12/2011, online at: http://www.aknews.com/en/aknews/2/281013/

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❖ Law of Transboundary Aquifers and Sovereignty of States

One of the most controversial articles of the Draft of the Law of the Transboundary Aquifers is the article 3 titled Sovereignty of Aquifer States. In international arena sovereignty is one of the most popular argument. States often suggest sovereignty on management and conversation of their natural resources. Also international law and international instruments like agreements and declarations recognizes the sovereignty of the states over their natural resources. Draft Articles on the law of the transboundary aquifers follows the track and refers to the U.N. Generals Assembly Resolution on Permanent Sovereignty over Natural Resources no. 1803 dated 14 December 1962, and states that "Each aquifer state has sovereignty over the portion of a transboundary aquifer or aquifer system located within its territory. It shall exercise its sovereignty in accordance with international law and present articles."

In the International Law Commission's comment on Shared Natural Resources in paragraph 2 of the draft article 3, it is stressed that many treaties and other international legal instruments refer to the sovereignty of states over natural resources. ILC's comment also states that by reference to the international law draft article 3 became a balanced text in paragraph 3 of the comment of the draft article 3.

The emphasis on sovereignty in the draft articles caused critics, even though the ILC's comment listed international treaties and legal documents which refers sovereignty of states on natural resources, both in preambles and provisions such as Vienna Convention for the Protection of Ozone Layer (1985), United Nations Framework Convention of Climate Change (1992), United Nations Convention on the Law of the Sea (1982), Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1999).

Stephen McCaffey, former Special Rapporteur of the ILC on the Law of the Non-Navigational Uses of the International Watercourses suggest that, the emphasis on sovereignty on transboundary aquifers will raise the abandoned doctrine of Harmon. He also states that 1997 U.N. Convention, International Law Association and International Court of Justice, have all rejected the concept of absolute sovereignty of the states on transboundary freshwater resources within their territory. McCaffey also objects the examples in the commentary by stating that, just two of those instruments concern freshwater and they reproduce the general formula of the Rio Declaration on Environment and Development. He adds that Principle 2 of Rio Declaration refers to states' "sovereign right to exploit their own resources" by emphasizing their "responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states."

States insists sovereignty on their portion of transboundary aquifers since large territories underlain by transboundary aquifers and historically groundwater are regarded as belonging to the state where it is located.

At the early stages of the debate of the draft articles, much of the members of the International Law Commission emphasised that permanent sovereignty over natural resources was central to the subject matter and must be placed in the Draft Articles.

Some of the members of the ILC and Sixth Committee of the UN insisted for a specific reference in the preamble of the General Assembly Resolution on permanent sovereignty. However some members insisted to

devote a specific article for the same purpose. Insisting to devote an article to permanent sovereignty was about the concern that those resources can be deemed as a common heritage of mankind. Hence none of aquifer states can claim sovereignty on their portion of a transboundary aquifer and conduct their policies in order to utilize, manage and preserve such resources.

The first sentence of the draft article 3 fits with the traditional notion of sovereignty. Second sentence aims to balance by stating that the sovereignty over the transboundary aquifers shall be conducted with the international law and draft articles. By stating this, the law of transboundary aquifers draft recognizes that the sovereignty is not absolute. As an addition to this explicit limitation, there are also some implicit limitations on the sovereignty of the states over the transboundary aquifers. The provisions on equitable and reasonable utilization, no significant harm, monitoring and exchange of data of the draft articles also limit the absolute sovereignty.

There were only six commentary states on the draft article 3. Those states are Austria, Brazil, Israel, Portugal, Cuba and Turkey. Portugal's comment on the draft article 3 has some differences of other five countries. Portugal emphasised that absolute sovereignty must be restricted by stating cooperation. On the other hand Brazil and Israel commented on sovereignty by an amendment that sovereignty should be exercised by transboundary aquifer states in accordance with international law. McCaffey interprets the comments of five states and ILC's position and concludes that while the comments of the states on the draft article 3 seem to reflect the Harmon doctrine in order to support their interest that they considered, states' practice in fact have not coherence with the infamous and discredited Harmon doctrine.

Although there are some claims that the first sentence of the draft article 3 "lets the genie of sovereignty out of bottle and the second sentence cannot put it back in" the essence of the draft does not connote an approach in general. In the general comment over the Law of Transboundary aquifers ILC states that the Special Rapporteur "also aware of dissimilarities among these resources he recognizes that the work on transboundary groundwaters could affect any future codification work by the commission on oil and natural gas."

In fact this explanation represents why sovereignty clause take place in the draft articles. ILC does not consider water in an aquifer different from oil and natural gas resources. ILC assumes water as an economic source that can be exploited by states. Arguing water as an economic resource like oil and natural gas is controversial. Many specialist, academics and politicians object to handle water just as an economic good, since water is vital for not only for human beings but also for the whole ecosystem.

Consequently emphasis on sovereignty on transboundary aquifers waters brings an important shift in customary international law of freshwater. However, if the draft takes a form like a convention at a later stage, according to the recommendation of the sixth committee, it will also bring several debates on the issue among the states.

"Law of Transboundary Aquifers and Sovereignty of States", Seyfi Kılıç, ORSAM, 30/12/2011, online at: http://www.orsam.org.tr/en/WaterResources/showAnalysisAgenda.aspx?ID=1506

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❖ The Palestinian deception

Op-ed: Palestinians speak language of peace to West, preach hate and war in Arabic

Eighteen years have passed since the signing of the Oslo accords, and it seems justifiable to reach the conclusion that there will be no final-status agreement that will solve the Arab Israeli conflict in the foreseeable future.

The recent reconciliation between the Palestinian Authority and Hamas – including the announcement that Hamas will join the PLO - is further evidence that Mahmoud Abbas was never sincere in pursuing a peace agreement with Israel.

Now that the chimera of a "peace process" has been exposed, the time has come to finally face the truth.

The Palestinian leadership has deceived Israel and the international community by speaking the language of "peace" to Western English-speaking audiences, while continually preaching hate and war to their own people in Arabic.

Duplicity and deceit have long concealed the true intentions of the Palestinian Authority, but its most recent actions and rhetoric have definitively revealed that it is not truly interested in peace and reconciliation with the Jewish state.

'Intelligent resistance'

A recent example of Palestinian deception is the manner in which the PA officially explains its refusal to negotiate with Israel.

The decision not to negotiate has been presented as a result of the Israeli insistence on building in the settlements while, in reality, the deadlock is the result of a revised policy that the PA adopted more than two years ago.

This revised policy was discussed by the Palestine Strategy Group and formed the basis for the 13th program of the Palestinian Authority published in 2009.

The program calls for "intelligent resistance" – meaning law fare, boycott campaigns and propaganda – as a means of continuing the struggle against Israel.

While terror has always been the main Palestinian weapon against Israel, under Abbas' leadership the strategy changed, and political warfare has proven to be more successful in winning over the international community to the Palestinian cause.

But there is more. Other factors, which were not openly discussed by the Palestinians, contributed significantly to the failure of the peace process.

The absence of truth in Palestinian politics and society is one of those factors. Jihad or Ribat (a religious war for Allah), and Islamic anti-Semitism (including incitement against Jews and Israel) are the others.

Confusing the world

Ever since the establishment of the Palestinian Authority in 1994, deception has been a tactic to confuse Israel and the rest of the world.

Conflicting reports about the meaning of Hamas' membership in the PLO issued recently by Fatah and Hamas leaders are the latest example of this tactic of deception, which is called al-Taqiyya and is primary based on the Koran.

According to the authoritative Arab text, Al-Taqiyya Fi Al-Islam, "Taqiyyah (deception) is of fundamental importance in Islam. Practically every Islamic sect agrees to it and practices it…Taqiyyah is very prevalent in Islamic politics, especially in the modern era."

Muhammad first practiced Taqiyyah during the Battle of the Trench (627AD,) which pitted his army against several non-Muslim tribes known as "the Confederates."

Arafat referred repeatedly to the use of Taqiyyah by Muhammad when he spoke about the Oslo accords to Islamic audiences.

'We will drive them out'

Fatah leader, Abbas Zaki, has repeatedly revealed the duplicity of the PA leaders.

On April 9th 2008 he told NBN TV the following: "The PLO has not changed its platform even one iota….The PLO proceeds through phases…..Allah willing we will drive them out of all of Palestine.

The same Zaki said the following this year on Lebanon TV: "When we say that the settlement should be based upon these (1967) borders, President (Abbas) understands, we understand, and everybody knows that the greater goal cannot be accomplished in one go. If Israel withdraws from Jerusalem, evacuates the 650,000 settlers and dismantles the wall – what will become of Israel? It will come to an end."

He then said: "It is not acceptable policy to say that we want to wipe Israel out. Don't say these things to the world, keep it to yourself."

Mahmoud Abbas is less outspoken but is no less involved in deceiving the international community. Take for example an interview with European reporters about the unity agreement with Hamas two weeks ago, in which he said the following:

"We set the agreement's pillars, and Hamas agreed with us that resistance will be popular and adopt peaceful ways, rather than military resistance." Peaceful resistance?

Well, when Hamas celebrated its 23th anniversary in Gaza the same week, Hamas PM Haniyeh called upon the Muslim Brotherhood to start a war to liberate Jerusalem He also said the following:

"We affirm that armed resistance is our strategic option and the only way to liberate our land, from the (Mediterranean) sea to the River (Jordan.) God willing, Hamas will lead the people… to the uprising until we liberate Palestine, all of Palestine".

Water issues

Deception and incitement have also been the hallmark of the way Palestinians inform the world about the day-to-day situation in the West Bank and in Gaza.

This summer our organization, Missing Peace, revealed that the PA continually lies about water issues in the West Bank in order to advance the narrative of Israeli repression and Palestinian victimhood.

Additionally, the PA has actually failed to implement approved water projects and ignored undeniable evidence of Palestinian water theft.

Reports by individual Palestinian citizens or Palestinian NGOs often contain similar false claims.

Meanwhile, Palestinian Media Watch just published a book titled Deception, which documents the hate, incitement and promotion of violence by PA officials and media.

The book also demonstrates how the Palestinian public, and especially children, are brainwashed into believing the most outrageous lies about Palestinian history, Israel and the Jews.

The book also recounts a meeting between Mahmoud Abbas and president Obama in the White House on June 9, 2010. During that meeting Abbas said:

"And I say in front of you, Mr. President, that we have nothing to do with incitement against Israel, and we're not doing that."

Until now, large parts of the international community have ignored the evidence about the Palestinian deception and insist that the conflict is about territorial claims. Yet it is not. This conflict is about the existence of a Jewish state in the Dar al-Islam (territory of Islam).

The EU even raised its contribution to the PA by €100 million for 2012 and keeps admonishing Israel for building activities in the West Bank and Jerusalem.

If foreign interlocutors like the EU are serious about ending the conflict they should first insist that the PA end incitement and confront the clear pattern of deception by Palestinian leaders.

"The Palestinian deception", Yochanan Visser, Sharon Shaked, 28/12/2011, online at: http://www.ynetnews.com/articles/0,7340,L-4167993,00.html

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❖ 'Israel missing 2B cubic meters of water'

Climate, water experts say that winter rains still far from helping alleviate Lake Kinneret's water plight as its levels sink 70 cm under Low Red Line

The Israeli winter is still far from truly helping Lake Kinneret's dwindling water levels, Israel Weather Service experts said on Sunday.

Climate experts were quoted as saying last week that while November help hope for a wet winter, December has proven to be "nearly bone-dry so far," effectively rendering the previous months' gain. Lake Kinneret's water level is currently 70 centimeters below the Low Red Line and 4.9 meters below its maximum capacity, meaning Israel is missing about two billion cubic meters of water.

According to the Israel Weather Service's (IWS) long-term forecasts the coming winter's rainfall is expected to be lower than average.

The IWS said that after a sever-year streak of dry winters, Israel's water reserves are virtually none-existent.

Meanwhile, Israel's national water company signed a financing agreement to build a desalination plant, which officials said could allow Israel not only to meet its own water needs, but to also export water to its neighbors.

The project is meant to become operational in 2013.

'Israel missing 2B cubic meters of water', 30/12/2011, online at: http://www.ynetnews.com/articles/0,7340,L-4166088,00.html

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❖ Israel Demolishes House, Razes Water Well, Land in West Bank

HEBRON, December 28, 2011 (WAFA) – Israeli forces Wednesday demolished a Palestinian house and two barracks used as animal barns in Jenin, and razed agricultural land and a water well in Hebron, according to local sources.

Israeli bulldozers, accompanied by soldiers and a civil administrator, razed and demolished about five dunums of agricultural land planted with olive and almond trees, as well as a water well in Al-Majd, a village west of Dura town in the northern West Bank city of Hebron.

Meanwhile, Israeli bulldozers demolished a Palestinian house and two barracks used as animal barns in Khirbet al-Mintar al-Sharqiya, near the village of Barta'a al-Sharqiya south of the northern West Bank city of Jenin, according to head of the village council in Barta'a, Ahmad Qabha.

He said that Israeli bulldozers prevented the owners of the house from removing their house contents before demolishing it without any prior notice.

"Israel Demolishes House, Razes Water Well, Land in West Bank", 28/12/2011, online at: http://english.wafa.ps/index.php?action=detail&id=18512

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❖ Desalination plant could make Israel water exporter

National water company says new facility will not only meet Israel's own water needs, it could also make it a top regional water exporter by 2014.

Israel's national water company signed a financing agreement to build a desalination plant, which officials said could allow drought-ridden Israel to export water to its neighbors upon completion in 2013.

Israel's ADL, a subsidiary of state-owned Mekorot, will build and operate the plant in the coastal city of Ashdod for 25 years, supplying 100 million cubic meters of desalinated water annually, the Finance Ministry said in a statement on Tuesday.

Israel is two-thirds arid and to avoid further depleting its fresh water sources it has become a world leader in desalination and wastewater recycling. The new Ashdod plant will join four other desalination facilities that to provide, by the end of 2013, 85% of the country's household water consumption.

"In the coming years we will be able to return water to nature and even sell water to our neighbors," said Energy and Water Minister Uzi Landau.

ADL secured funding for the project from Israel's Bank Hapoalim and the European Investment Bank (EIB), the statement said.

The Finance Ministry had previously put a $400 million price tag on the plant, which will use reverse-osmosis to desalinate seawater from the Mediterranean.

"Desalination plant could make Israel water exporter", 27/12/2011, online at:
http://www.ynetnews.com/articles/0,7340,L-4166084,00.html

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❖ Green groups urge Israeli government: Stop killing off the Dead Sea

Israel Union for Environmental Defense and the Movement for Quality Government calls for steps to bar Dead Sea Works from promoting projects that would likely worsen the impact of industrial activity on the sea.
By Zafrir Rinat

As the negotiations between the Finance Ministry and Dead Sea Works over royalties the latter will pay to the state near completion, the Israel Union for Environmental Defense and the Movement for Quality Government are calling for steps that would bar the factories from promoting projects that would likely worsen the impact of industrial activity on the sea, including increasing the amount of water pumped out of the sea for the factories' use.

This request coincides with the release of a new Geological Institute study that assesses that the factories will have a greater impact on the rate of the deline in the level of the Dead Sea in the future.
Dead Sea – Gil Cohen Magen – 27122011

An aerial view of the Dead Sea last month. The state is seeking increased royalties from the factories.
Photo by: Gil Cohen Magen

The Finance Ministry's negotiations with Israel Chemicals over funding for efforts to protect the Dead Sea area hotels from flooding at one of the industrial pools and royalties to be paid to the state for exploiting the Dead Sea's minerals, primarily potassium, are nearing their end. The ministry argues that the factories must pay around 90 percent of the cost of the protective measures for the hotels, and that they must double the royalties paid from the sale of potassium from 5 percent to 10 percent. Finance Minister Yuval Steinitz clarified yesterday that if the ministry's demands were not met, within a few days a Sheshinsky Committee II would be formed to review the state's share of the profits from the exploitation of the Dead Sea's resources.

Yesterday, Minister of Tourism Stas Misezhnikov and Environmental Protection Minister Gilad Erdan contacted the Finance Ministry and argued that even if an agreement is reached, this should not be seen as the end of the matter. "If the royalties are not increased as the exploitation of the natural resources rises, the factories have a clear interest in increasing their production as much as possible, also at the expense of the sea," the ministers noted.

The approaches made by the Israel Union for Environmental Defense and the Movement for Quality Government also asked not to allow the launch of projects such as the construction of another industrial pool for the factories.

Recently, the Geological Institute completed a feasibility study for the Dead Sea-Med Sea canal project being carried out by the World Bank. Together with Tahal, the Geological Institute examined different scenarios for the status of the Dead Sea if the canal project (from the Gulf of Eilat to the Dead Sea) is not undertaken and the existing plants in Israel and Jordan continue their operations, and what will happen if they cease their operations.

The study indicates that the current annual rate of decline of the Dead Sea water level is 115 centimeters. The study's authors estimate that the Israeli and Jordanian plants are responsible for 50 centimeters of this decline, a figure that is not accepted by the plants, which claim they are responsible for a much lower amount of the decline in the water level.

The study also indicates that if there are no additional sources of water flowing into the sea and the industrial operations continue, the salinity of the sea will increase and as a result, the water evaporation will decline. This would mean that if the plants continue pumping water and even increase the quantity pumped, they would then be responsible for a larger share of the declining water level relative to natural evaporation. The study speculates that in such a scenario, the water level would drop from 425 meters below the level of the Mediterranean Sea to 490 meters in 2075.

The plants in Jordan and Israel use pumping stations and transfer water from the northern Dead Sea basin to the huge industrial pools, and the minerals that settle in them are used for industrial purposes. Thereafter, the salt mixtures are transferred back to the sea.

Dead Sea Works said in response that it was negotiating with the Finance Ministry with the intention and goal of reaching an agreement.

"Green groups urge Israeli government: Stop killing off the Dead Sea", Haaretz, 29/12/2011, online at: http://mideastenvironment.apps01.yorku.ca/?p=3983

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❖ Project to preserve Dead Sea must safguard its character – study

AMMAN — A project to preserve the shrinking Dead Sea by replenishing it with Red Sea water cannot stop the salt lake from diminishing further without altering its unique qualities, a recent study indicated.

The Dead Sea modelling study, which examined the potential impact of the Red Sea-Dead Sea Water Conveyance Project on the lake's environs, found that the biological, geological and chemical characteristics of the Dead Sea would not be "greatly influenced" if fewer than 400 million cubic metres (mcm) of seawater were channelled into the rapidly shrinking lake each year.

However, the study determined that more than 700mcm of additional water per year is needed in order to stabilise water levels in the salt lake, adding that larger inflows would need to be introduced "very carefully while monitoring the response of the system to the dilution".

The report warned that the development of stratification (the separation of waters with different salinity, density, or temperature), which could be caused by a large influx of added water, may increase the rate of sinkhole formation.

According to conservationists, sinkholes are created when water coming from surrounding mountains to compensate for lost water in the Dead Sea dissolves underground salt deposits, creating massive cavities.

The study, which was completed in August, also examined the state of the Dead Sea in the event of a "no action" scenario, examining how the water level, water balance and chemistry of the Dead Sea will evolve in the future if the Red-Dead project is not implemented.

"The Dead Sea's level in the coming decades is expected to continue to decline at a rate of 1.0-1.2 metres per year," the report concluded.

In the longer term, the rate of decline will gradually decrease. The salinity, density and temperature of the Dead Sea will continue to rise, however, while halite (rock salt) will continue to precipitate and accumulate on the Dead Sea's floor, according to the study.

"Conditions for life in the lake will become increasingly difficult," the report added.

The study is part of the Red Sea-Dead Sea Water Conveyance Study Programme, which entails five interrelated studies, also including a feasibility study, an environmental and social assessment, a study of alternatives and a Red Sea modelling study.

The study covered several issues in the geology and biology of the Dead Sea, such as gypsum precipitation, biological blooming, limnology and meteorology, remote sensing, surface and groundwater flows, and the development of sinkholes.

"Project to preserve Dead Sea must safguard its character – study", Jordan Times, 29/12/2011, online at: http://mideastenvironment.apps01.yorku.ca/?p=3985

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❖ High Court says Israel can take advantage of West Bank resources

Court adopts state position: no new Israeli-owned quarries should be established in the West Bank, but existing ones should be allowed to continue operating.
By Zafrir Rinat ‘

The High Court of Justice has authorized Israel to exploit the West Bank’s natural resources for its own economic needs by rejecting a petition against the operation of Israeli-owned quarries in the territory.

In its ruling, issued on Monday, the court adopted the state’s position: that no new Israeli-owned quarries should be established in the West Bank, but existing ones should be allowed to continue operating.
quarry – Alex Levac – January 31 2011

A quarry in the West Bank (illustrative only).
Photo by: Alex Levac

The petition was filed two years ago by the Yesh Din organization. It argued that the 10 Israeli-owned quarries in the West Bank violate international law, which states that an occupier may not exploit an occupied territory’s natural resources for its own economic benefit; it may use such resources only for the benefit of the occupied people or for military purposes.

The Israeli quarries sell 94 percent of their yield to Israel and supply almost 25 percent of Israel’s total consumption of the raw materials in question. But until the petition was filed, the state had never seen any problem with this.

Supreme Court President Dorit Beinisch, who wrote the ruling, began by accepting the state’s view that the Israeli-Palestinian interim agreement permits the quarries to operate in their present manner until a final-status agreement is signed.

She then moved on to discuss what international law has to say, and particularly Article 55 of the Fourth Hague Convention, on which the petition was based. That article requires the occupying power to “safeguard the capital” of the occupied party’s natural resources and “administer them in accordance with the rules of usufruct,” meaning the rules governing fair usage.

But Beinisch accepted the state’s position that Israel’s use of the quarries is limited and does not amount to destroying their “capital,” and hence does not violate international law. This position is bolstered, she said, by the state’s decision not to permit any new quarries to open.

Moreover, she said, it is necessary to take account of the fact that the West Bank has been under a prolonged and continuing occupation, so the territory’s economic development cannot be put on ice until the occupation ends. The quarries, she noted, supply jobs and training to a non-negligible number of Palestinians; some of their yield is sold to the Palestinians; and the royalties the quarry owners pay the state – almost NIS 30 million a year – are used by the Civil Administration in the territories to fund projects that benefit the Palestinian population.

"In this situation, it's hard to accept the petitioner's unequivocal assertion that the quarries' operation does nothing to advance the [Palestinian] region, especially in light of the Israeli and Palestinian sides' mutual economic interests and the prolonged duration" of Israel's presence in the West Bank, she concluded.

The petition was not a total loss for Yesh Din: Both the decision not to open new quarries and the decision to allocate all the royalties to the Civil Administration were made only after it was filed.

Nevertheless, attorney Michael Sfard, who represented Yesh Din, was disappointed.

"Mining natural resources in occupied territory for the economic needs of the occupying state is looting," he said. "The High Court's argument, that one should relate differently to a long-term occupation, cannot legitimate economic activity like this, which harms the local residents."

"High Court says Israel can take advantage of West Bank resources", Haaretz, 29/12/2011, online at: http://mideastenvironment.apps01.yorku.ca/?p=3992

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❖ Israel Chemicals agrees to pay 90% of cost for dredging southern Dead Sea

Final agreement with state remains pending; total costs unclear.
By Ora Coren

Israel Chemicals has agreed to shoulder most of the cost of dredging salt from the bottom of the Dead Sea's southern half, to rescue the hotel industry from being engulfed by the rising level of brine.

The company, a member of the Ofer family's Israel Corporation group, has thus accepted the main thrust of the Finance Ministry's proposal, which is that it pay 90% of the cost.
Dead Sea

The hotels on the Dead Sea's shore may be saved from inundation.
Photo by: Michal Fattal

ICL says the total cost of dredging the seabed until the year 2030, when its franchise runs out anyway, is estimated at NIS 3.8 billion.

The state and company have yet to agree what to do if the cost proves higher. The state for its part thinks the cost will be nearer NIS 5 billion and the Finance Ministry thinks ICL should shoulder the entire difference, if any.

ICL, on the other hand, is not happy with such an arrangement and thinks the parties should break down types of deviations from the estimates, rather than have it shoulder the entire burden. For instance, the company says, costs could deviate from the estimates for reasons beyond its control.

The company has also agreed to increase the royalties it pays the state from 5% of sales above 2 million tons of potash a year to 10%. Under previous agreements, the state can demand 10% of sales when sales run higher than 3 million tons a year.

In exchange for its acquiescence, ICL expects the state to forgo setting up another public committee that would discuss increasing the royalties for exploitation of natural resources.

A final agreement between the state and ICL remains to be signed. The High Court of Justice has given the two sides until January 7, 2012, to sign the deal.

The part of the Dead Sea that Israelis think of as its southern half is actually a gigantic evaporation pool from which the company, Dead Sea Works, a subsidiary of ICL, extracts potash and other minerals, most of which are exported.

The company transports mineral-rich water from the northern part of the sea to its southern end canal. The snag is that the water also bears silt. This silt builds up in the southern part, raising the water level.

The hotels would have been inundated long ago if not for giant earth berms, which bear environmental costs of their own.

ICL said it was negotiating with a positive attitude with the goal of reaching an agreement with the Finance Ministry.

The Finance Ministry said it had been negotiating with ICL intensively for months and last week had provided its final proposal, which ICL is supposed to respond to by tomorrow night.

Ministers oppose plan, demand higher royalties

Environmental Protection Minister Gilad Erdan and Tourism Minister Stas Misezhnikov oppose the proposed agreement between the state and ICL. They are demanding Israel Chemicals pay higher royalties, similar to those required with the regard to the exploitation of other natural resources and stipulated by the Sheshinski Committee relating to natural gas.

The two ministers agree that ICL should pay its 90% share of the salt-removal costs, but also want the company to double the royalties it pays for exploiting Israel's natural resources.

"Israel Chemicals agrees to pay 90% of cost for dredging southern Dead Sea", Haaretz, 26/12/2011, online at: http://mideastenvironment.apps01.yorku.ca/?p=3971

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❖ Quality of Jordan's drinking water: Filtering fact from fiction

AMMAN- Although fewer Jordanians are drinking tap water due to quality concerns, officials and experts stressed that tap water is safe and that alternatives are not as perfect as they seem.

Studies and interviews with consumers show that authorities have failed to sway consumers, many of whom were turned away from public water by the 1998 water pollution crisis, which shook consumer confidence and gave rise to hundreds of bottled water outlets.

Currently, around 80 per cent of the central region's residents buy bottled water, according to a study conducted by the Jordanian-German Water Programme.

With 32 bottled water factories, 542 local water purification plants and five mineral water bottling plants in the Kingdom, citizens are not short of options when turning off the tap, according to the Ministry of Health.

Not satisfied, not convinced

With the exception of a few cases, like Salameh Hammad, 69, and homemaker Nadia Abu Rummaneh, the majority of citizens interviewed by The Jordan Times said they do not trust tap water.

"I never felt a change in the taste of tap water. My family and I drink from the tap and we all enjoy good health," Hammad said.

Nadia Abu Rummaneh agreed: "The water is clean, it tastes OK and I don't have to go through the hassle of having water delivered," she said.

Many others, however, have gone out of their way just to avoid drinking water supplied by the Water Authority of Jordan (WAJ).

Dana Eleimat said her family does not only rely on bottled water, but has installed a filter to ensure the tap water used for non-drinking purposes is "clean". Even with a filter, she said the "smell and colour" of tap water is unappealing.

Husam Zarrour, a resident of Dahyet Amir Rashed, in westAmman, said last year he bought a carbon filter and installed it in the kitchen, citing fears for his family's health.

The Jordanian-German study suggests that Eleimat and Zarrour are not the only ones who fear the Kingdom's tap water.

In it, researchers surveyed 420 households in Zarqa, Balqa and Madaba to assess consumer satisfaction with the quality of water supplied by the WAJ. The study found that consumer perception of WAJ water quality was mostly "negative".

'Rest assured'

Suzan Kilani, director of the laboratories and water quality directorate at the WAJ, insisted that the water pumped to households in the Kingdom is safe, clean, and meets international standards, thanks to strict testing and quality assurance methods.

"All the country's water resources, pumping stations, boosters and networks are subject to regular monitoring," Kilani told The Jordan Times in a recent interview.

"We test water for chemical substance concentration and run regular tests to check water colour, taste, odour, murkiness and temperature, which determines the efficiency of the purification process when chlorine is added to the water," she added.

Kilani acknowledged that nevertheless, certain useful substances are eliminated in the process, while others become highly concentrated at the end of a water network, such as trihalomethanes (THM), which, in high levels, can become carcinogenic.

THMs are a group of four chemicals formed when chlorine and other disinfection byproducts are used to control microbial contaminants in drinking water; these react with naturally occurring organic and inorganic matter in water, according to web sources.

"If harmful chemicals are found, we take measures to reduce their concentration by infusing clean water, treating it, or just stopping the water flow," Keilani said.

Concerning the water's "chlorine odour", Kilani said that chlorine is the only way of disinfecting water, stressing that less than 0.2 milligramme per litre reaches end users.

Pipe problem

The worn-out pipeline network, however, poses a major problem to water quality. Due to broken pipes, water might easily become polluted by the sewage network, a threat that requires ongoing microbiological tests, she noted.

Kilani attributed occasional water pollution incidents to the country's intermittent water supply.

Scarce water resources inJordan, categorised as the fourth poorest country in the world in terms of water availability, forced the Kingdom in the early 1980s to apply the water distribution programme, under which households receive water on a rotation basis for a few hours during a certain period of time, usually a week. The resulting intermittent water flow combined with the worn-out pipe network, can be the perfect storm for pollutants, experts say.

"When water flow is disrupted, negative pressure forms in the pipes, which then suck in sewage, if pipes are broken and adjacent, into the network," Kilani explained.

Water expert andUniversityofJordanprofessor Elias Salameh said the quality of water in the Kingdom is "good" at the source, but drops during the pumping process.

Consumer responsibility

Consumers are also responsible for the quality of water that comes from their faucet, experts say. Statistics indicate that 70 per cent of complaints about water taste and odour are due to the condition of roof-top tanks.

“People do not usually check roof tanks or they leave them open. Water from the water authority is clean, but it gets polluted in these tanks,” she noted.

Salameh agreed, saying that the quality of tap water worsens when it is kept for long periods in household roof tanks.

“The longer water is kept in tanks the more its quality degrades; water must be consumed gradually instead of being stored, but constant water pumping is impossible,” he said.

Alternatives not perfect

If there are concerns about tap water, the alternatives are not much better, according to experts.

“Bottled water is merely tap water that undergoes a purification process. We don’t know for sure what desalination plants use to purify it, so regular monitoring is a must,” Salameh said, adding that the monitoring process is not consistent.

The heavy filtering of plants’ purification processes strips water of minerals necessary for the body, experts added.

Bottled water that is left in the sun or exposed in the heat can also pose a health risk, the expert underscored, warning that several providers fail to keep water in cool and shaded areas.

Other concerns include reuse of plastic water containers and bottled water that have been stored for months before reaching consumers.

“Water must be consumed within a month after production and be disposed of after that,” he stressed.

Arab Medical Association Against Cancer Secretary General Sami Khatib agreed, noting that exposing water bottles to sunlight can pose a health threat. Claims that water becomes carcinogenic as a result of sun exposure, however, are not scientifically substantiated.

Salameh said that tap water provided to people by the WAJ is “safer than some of the bottled water people buy”.

“If people want to be extra careful, all they have to do is install water filters, which cost JD20-JD30,” he said.

Environment Department Director at the Ministry of Health Salah Hiyari also believes that people’s concerns about the safety of the authority’s water are unfounded.

"Concerned authorities, including the WAJ, The Jordan Water Company (Miyahuna) and the health ministry, would not tolerate any error when it comes to water safety," he told The Jordan Times, stressing that his ministry keeps a close eye on quality and strictly monitors desalinated and bottled water plants' health conditions and operations.

Ministry inspectors carry out tests in 21 affiliated water quality labs that test water for physical and chemical properties and for fungi, Hiyari said.

Tareq Khammash, owner of a desalination plant in Arjan, said inspectors from the ministries of health and environment visit his plant once a month and take samples for testing. Sometimes inspectors show up announced, he added.

But strict standards and regulations do not mean that all desalination plants and water factories comply: Around 91 desalination plants and eight factories were issued warnings in 2009 by the health ministry's environment department, while four water companies and 73 desalination plants were shut down last year.

Water officials acknowledged that such facts should be made known to ever-sceptic consumers such as Eleimat, who despite keeping a cautious eye on the tap, overlook the fact that bottled water is far from perfect.

This article was first published in The Jordan Times on30 August 2010. It won the first prize of the 2011 Environmental Media Award

"Quality of Jordan's drinking water: Filtering fact from fiction", Jordan Times, 26/12/2011, online at: http://mideastenvironment.apps01.yorku.ca/?p=3973

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❖ Officials plan water plant to end crisis

JERUSALEM (Ma'an) — The Palestinian Water Authority is working to establish a major desalination plant by the Dead Sea, its chief has revealed.

The plan is designed to help ease the water crisis in the West Bank and Gaza by providing an extra 100 million cubic meters of water, Shaddad al-Attili said.

However it will stand or fall on the approval of a joint Israeli-Palestinian committee, he told Ma'an after attending a water conference in Israel organized by Friends of the Earth Middle East.

The water agency is hamstrung by the requirement set in the Oslo Accords that all projects go through the Joint Water Committee, in which Israel can veto any plans, he said.

Water is one of the six final status issues outlined in the 1993 accords to be resolved in a peace treaty with Israel, alongside borders, refugees, settlements, Jerusalem and security.

The Israeli-Palestinian JWC differs from other such committees in that it does not address shared water resources, but just the division of Palestinian resources in the West Bank.

Water crisis

Al-Attili said Palestine's share of water has not changed in the near 20 years since the accords established the committee, despite high population growth.

"Israel is controlling 93 percent of the water in the region while Palestinians have only seven percent," he said.

Al-Attili said that by the year 2000, Palestine should be using 200 million cubic meters of water per year, but 2010 water authority data shows Palestinians can access only 96 million cubic meters.

"We pay for drinking water. Water in Gaza is undrinkable because it's salty and contaminated," he said.

"When Gazans take showers they are soaked with salt and children's skin has turned to blue due to chemicals," Al-Attili added, without elaborating on the condition.

Control of resources

Al-Attili said Israel's expansion of settlements, which monopolize the West Bank's water supply, and Israel's vetoes on Palestinian water projects contribute to the water crisis.

Israel's military control over 60 percent of the West Bank, which prevents Palestinians from accessing rivers, springs and wells, exacerbates the problem, Al-Attili said.

Meanwhile, Israel has drilled deeper into West Bank aquifers than the shallow wells drilled by Palestinians before Israel's occupation, draining much of the Palestinians' water supply.

Al-Attili said the PA had a workable solution to the water crisis, in line with international law, under which Israel could build its own desalination plants to compensate for water supplies returned to Palestinians.

The authority is also working on plans to transfer water from the Red Sea to the Dead Sea, which would replenish the Dead Sea as well as providing water for desalination.

He urged Israeli officials to discuss a solution to the crisis, based on the two-state model, adding that a Palestinian state could not be established without a solution to the division of water resources.

"We are looking for a solution to the conflict. No one wants this conflict," Al-Attili said.

"Having a clean water is a basic right, but this right is taken from us. Can Israel accept that its neighbors have no water?"

"Officials plan water plant to end crisis", Maan, 26/12/2011, online at:
http://mideastenvironment.apps01.yorku.ca/?p=3975

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❖ Jordan's Water Crisis

The problem of water scarcity puts an undeniable blight on the lives of millions of people, including in Jordan which has been ranked tenth out of the seventeen states in "extreme risk" by Maplecroft's Water Stress Index. The challenges of water scarcity may seem remote to visitors to the rich areas of West Amman and international tourist sites such as Petra and the Dead Sea, but they are real enough for ordinary residents, particularly those living outside the capital. Agricultural production, a key economic activity, is increasingly expensive and difficult as the costs of water rise. And the future lack of water poses a threat to the growing population of this small kingdom.

The words of Steve Watson in Liquid Asset evidence a certain hope when he says, "all around the world simple, effective systems can be put in place to change the way that water is accessed." Yes indeed – if only people didn't get in the way!

There is much to achieve before this vision can be realized in Jordan and the wider region of the Middle East and North Africa (MENA).

The water shortage has not just been caused by climate change: forced migration, conflict and bad governance have exacerbated the crisis and prevented application of easy solutions. Jordan is a case study of how these manmade issues impact on the problem of water scarcity.

More people means more strain on existing water supplies. Jordan's population, currently at standing at six and a half million, is on the rise. Declining infant mortality rates, greater wealth and the trend to have more children are all contributing to an average annual population increase of +0.984%. Furthermore, the population is becoming increasingly concentrated in urban areas, with an annual rate of urbanisation of 1.6%.

Adding to the natural demographic burden on Jordan's precious resources are the human-made factors of immigration and conflict. Since its independence in 1946, Jordan has participated in, or been neighbour to, many conflicts – the 1948 Arab-Israeli War, the 1967 Six Day War, the 1973 Yom Kippur War, and most recently along its borders the Iraq Wars and continuing Arab-Israeli conflicts. The effect has been to create an enormous Palestinian sector within Jordan, estimated to be over half the total population, straining not only the resources but the tolerance of Jordanians themselves. There has also been an influx of Iraqi refugees since 2003 while the escalating crisis in Syria is causing a further influx of displaced persons, causing even more strain on already over-stretched public ultities such as water.

The instability of its region has further affected Jordan's natural water supplies. The Jordan River, once a major source of water for the kingdom, was diverted after animosity grew between its stakeholders. The dams built by Syria, Israel and Jordan have caused the river to lose 95% of its original flow. This has also been the fate of Jordan's other significant waterway, the Yarmouk River, which is now reduced to a mere muddy trickle.

In 2009 the chairman of Friends Of The Earth Middle East, Munquth Meyhar, said, "The conflict made every country do their best to grab as much as they can, and non-cooperation between them is

what really affected the area." It is an oft-repeated adage that the wars of the future will be fought over water – but this is already sad reality in the MENA region.

With the imperfect hand of cards already dealt to Jordan, the problem of governance is unsurprisingly critical in securing the future of its natural resources.

Local governance is a crippling problem for Jordan's water projects. The Disi Water Conveyance Project, which aims to carry water from underground resources shared with Saudi Arabi to the capital Amman, has seen constant interruptions to its construction due to local disputes. Typically for such incidents, contracts are handed to a certain tribe or businessman for transport or logistics, causing a rival tribe to attack the site and shut down work. It is clearly far from the dream of Watson's notion that, "Researchers have found… that by working with local communities, it can be possible to demonstrate the undeniable benefits of decentralized water treatment." First and foremost it is necessary to stop them shooting at one another!

Adding to the woes of the Disi project, reports have indicated a high level of radioactivity in the water. While some water sources around the world do contain high levels of radiation, dealing with this problem is expensive and, in the context of Jordan, it has been estimated that the cost of doing so will rise to 10% of the average earnings of an Amman resident. Indeed, recent cost increases have occasioned protests – a sign of things to come.

The fundamental problem highlighted by the examples given above is the weakness of state institutions such as the police, the criminal justice system and even the ministries. There is little 'joined-up government' between self-interested parties such as the Ministry of Planning and International Cooperation (which doles out international aid), the Ministry of Water and Irrigation and the leaders of individual projects.

Real leadership comes from Jordan's political elite headed by King Abdullah II, who has proven himself adept at appealing to aid-giving states such as the US while maintaining authority with his own people – although the Arab Spring is testing this assumption rather vigorously. Tribal violence is increasing as frustration at the lack of progress in resolving the Arab-Israeli conflict needles the tensions at the heart of Jordan's heterogeneous society. Can one man guide a factious population through the numerous perils of the energy crisis and regional instability?

It is difficult to see any way in which simply working with local communities and bringing in technology can solve the intractable resource challenges of poor countries in the MENA region. Jordan suffers acutely from demographic, migration and political issues – all of which mean that solutions must reach far beyond working with local people and giving aid for water projects.

The key public goods that must be bolstered are those of security and accountability. Security will guarantee Jordan's borders and, through stability, encourage the economic and societal developments that are essential in establishing major infrastructure projects such as those required to relieve the country's water scarcity. Accountability must be established to scrutinise the work of government and politicians so as to give their work sufficient legitimacy, making projects more efficient and better accepted by inhabitants who feel their positive effects.

The consequences for Jordan if the internal problems of bad governance continue are severe. Increasing water prices will cause widespread unrest and exacerbate the deep fissures at the heart of Jordanian society. There is little it can do to prevent the profound regional vicissitudes, but the government must work with aid organisations and donors, which in turn must link their aid at every stage to transparency and good governance.

"Jordan's Water Crisis", 21/12/2011, online at: http://futurechallenges.org/local/jordans-water-crisis/

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❖ 7 Agricultural Solutions That Will Save the Middle East

There's no getting around it: the world is becoming a much less secure place in which to live. Economies are tanking, geo-political systems are in turmoil, weather events such as wintertime drought are becoming more frequent and serious, and already dangerous planetary warming is being exacerbated by phenomenon such as giant plumes of gurgling methane discovered in the great white north. All of these factors have an impact on the ability of ordinary people to find healthy food at decent prices. So we have gathered 7 agricultural solutions that are being harnessed in the Middle East region to address these challenges and increase our resilience amidst one of the most uncertain times that humanity has faced. Read on for the not-to-miss list.

Groasis Waterboxx Trees

It's absolutely essential that we find solutions that address our unique challenges, and the Groasis Waterboxx is one of them. Launched in Jordan earlier this year, the Groasis Waterboxx makes it possible to grow a sapling without shoveling soil or using excess water.

Originally introduced by AquaPro Holland and invented by Pieter Hoff, the Groasis relies on biomimicry to nurture seeds similarly to the way that nature does in particularly harsh environments such as the desert. Its ergonomic design efficiently harvests rain and condensation to ensure the maximum amount of growth effect with the smallest amount of hydrological input – an excellent solution that definitely targets the Middle East's specific agricultural challenges.

AeroFarms Vertical Farming

Green Prophet writer Susan Kraemer wrote that AeroFarms could herald one of the most important developments in food harvesting since humans switched from hunting and gathering to farming.

These clever stacked farms that can be used virtually anywhere – including inside buildings in the heart of any city – use aeroponic farming technology instead of soil and sunshine to grow food. Saudi Arabia has already embraced the technology that specifically addresses estimates that 80% of the world's burgeoning population will be living in cities by 2050.

Yemenite Rainwater Harvesting

Food grows where water flows, so harvesting rainwater in nearly dry cities such as Sana'a in Yemen is absolutely pivotal to any kind of agricultural success. Which is why Sabrina Faber's award-winning rainwater capture system is so clever. Adding to its ingenuity is its sheer simplicity: the rainwater harvesting system will be incorporated into rooftops and is modeled after traditional capture designs Faber has seen out in Yemen's countryside.

Gaza's Green Roofs of Herbs and Vegetables

They" say that necessity is the mother of invention, and this is turning out to be particularly true when it comes to food. Many residents in Gaza have experienced have embraced one of the largest growing urban agricultural solutions.

Having no land and stunted access to to food, many people in this politically-charged strip of land are growing cabbage, eggplants, and endochriyya [a plant used for making soup] in the winter, as well as chili,

garlic, and onions in summer, and they are doing all of this on their flat rooftops that receive plenty of sunlight. Several rooftop farming initiatives have popped up in Cairo and Beirut as well.

Liveinslums Microgardens in Cairo

A Non-Governmental Organization (NGO), Liveinslums has worked with local architects and designers to help residents in Cairo's neglected City of the Dead grow microjardins – mini, soilless, and transportable subsistence gardens that also fertilize the sand. In addition to being incredibly portable, the microjardins are easy to construct.

Liveinslums provide seeds, turf and perlite, which act as a substitute to soil, vitamin solutions that are added to water, and plastic, wood, and other recycled materials out of which these mini gardens are made. Initiatives like this demonstrate that with the right amount of tender loving care, food can be grown anywhere!

Feeding Abu Dhabi With Water From Air

Despite having some of the world's most largest and grandest desalination plants, the Gulf countries are quite possibly the most vulnerable when it comes to water, and they are rising to the challenge with some of the most sophisticated water capture innovations.

With an average humidity level of 61% , the Abu Dhabi Farmers' Services Center (FSC) has spearheaded G-earth - a technology that extracts condensation from the air to provide water for Abu Dhabi greenhouses.

SEKEM – Egyptian Organic Farm

Organic farming may not be new, but Egypt's largest is so successful that we can't ignore its potential to not only save people from food shortages, but also to restore the country's soil to sustainable levels.

Established by Dr. Ibrahim Abouleish in 1977, SEKEM is an organic farming community that integrates social, economic and environmental development just outside Cairo. Run by Dr. Abouleish's son Helmy, this incredible enterprise that champions the best in sustainable farming techniques has grown from 70 hectares to several thousand!

"7 Agricultural Solutions That Will Save the Middle East", Tafline Laylin, 26/12/2011, online at: http://www.greenprophet.com/2011/12/7-agricultural-solutions-middle-east/

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❖ China leads new security scheme on upper Mekong

From now on, China will be the major partner in providing security along the region's longest river - the mighty Mekong River. The river's coordinated patrol between upper (China, Burma) and lower riparian countries (Thailand and Laos) began in earnest early this month. It is a China-led security scheme with neighboring countries - the first in Chinese history - that will impact on the overall strategic landscape in the region and far beyond in the future.

China has accorded a top priority to safety and security of the 4,880 kilometer river, which Beijing considers as a strategic shipping route. That helps explain why China's reaction was so swift and unprecedented to the murder of 13 Chinese sailors on two cargo ships in the Golden Triangle - an area bordering Burma, Laos and Thailand which is festered with armed drug warlords, ethnic insurgents, smugglers and mercenaries. In the past weeks, both the Chinese authorities and media have been highlighting the issue since the October 5 tragedy. Chinese Premier Wen Jiabao even called his Thai counterpart, Yingluck Shinawatra, to express concern and urged the Thai side to help with the investigation of the massacre. Within days, Deputy Prime Minister Chalerm Yoobamrung alleged nine Thai soldiers from Pa Muang Task Force in Chiang Rai were involved in the murder as the investigation continues.

The attack provides a groundswell for China to move quickly to protect its citizens and work out a mechanism of law enforcement and security cooperation among the four countries.

Along with this effort, Beijing earlier proposed a plan to form a joint patrol operation along the 273-kilometre portion of the Mekong River with their security forces on board the Chinese patrol boats. Thailand was among the first country to decline the idea as joint-security operation with foreign forces need approval from the Parliament under Article 190 of the charter - something the current government does not want to go through. However, Thailand agreed to a proposal calling for the establishment of Combined Operations Centre in Guanlei, Xishuangbanna that will act as the focal point for intelligence information about cargo ships travelling in and out of river ports to coordinate patrols. This way the Thai security forces can take up river patrols once the Chinese special force reaches the 9-kilometre segment of Thai territorial waters. So far, Thailand has yet to respond to China's offer that Thai patrol boats could sail upstream in security uniforms, if need be. At the moment, two Thai officials are attached to the centre in Guanlei.

Pol Gen Wichean Potephosree, secretary-general of the National Security Council (NSC) told the author last week the arrangement was working very well and would deter cross-border crime. He said tourists and traders had gradually returned, including cargo transports from Yunnan to Chiang Saen after two quiet months due to the suspension of all shipping and touring along the river. He added that since the conclusion of Asean-China Free Trade Area, trade at this port had risen to an estimated of Bt200 million a day prior to the attack.

For centuries, the Mekong has served as the main transport route for people and goods from inland south-western China criss-crossing the heartland of Southeast Asia through Burma, Laos, Thailand, Cambodia down to the South China Sea via Vietnam. It was only in 2005 that blasting to clear away rapids and deepen the river's channel was completed to allow navigation, especially along the upper Mekong, and the passage of bigger boats, promoting trade and tourism. As nearly all of the boats carry the Chinese flag and operate between Guanlei and Chiang Saen, the China-Thai cooperation has inevitably become pivotal in this new security surveillance. According to a statistic given by the NSC, there were only two robbery and attack incidents along the river between 2005-2010. However, the number shot up to 12 this year alone. The urgency to provide public safety along the river is quite obvious.

During the three-day visit of Vice President Xi Jinping to Bangkok last week, Xi emphasised China's readiness to deepen the strategic partnership with Thailand to contribute to regional stability and prosperity.

Both Thai and Chinese leaders hailed the Mekong's new securitycooperation as a testimony of their increased strategic cooperation. Xi also included safety and security on the Mekong as one of four points on apriority plan to strengthen future Thai-China ties. Most importantly, both countries have agreed to set a two-way trade target of US$100 billion by 2015, when Asean becomes a single community. To do so, the Mekong must be safe and secure to facilitate bilateral imports and exports. At the moment, land transport between the two countries, which do not share a common border, is under-developed. River transport, albeit time-consuming, is still viable. According to a Chinese statistic, more than three million tonnes of cargo was moved south from Yunnan between 2000-2009.

Obviously, this new security frame-work is still a work in progress. At the moment, the Chinese authorities and media called the cooperation as joint patrols or multinational forces to safeguard the Mekong. Thai authorities still describe the cooperation clearly as a coordinated patrol because China's special force and boats are not allowed to enter Thai waters. Therefore, this framework could be further modified depending on the outcome of cooperation on the river. Furthermore, this is also the first time that a special force from the Ministry of Public Security is taking part in a regional security manoeuvre. They were asked to familiarise with local environment, culture and taboos. If the scheme proceeds smoothly, it could be expanded.

China's enthusiasm in providing security on the Mekong is indicative of its strong determination to face up to future challenges that might emanate from this strategic river. At the moment, there are several bilateral, trilateral, regional and multinational frameworks for developing the Mekong basin with some overlapping features. For instance, at present the US-led Lower Mekong Initiative has already served as a valuable framework for the US to work closely with lower riparian states but it is limited to non-security matters plus the environment, health, education and infrastructure. In the long-haul, it may affect upper riparian countries if lower members are able to consolidate their positions on key issues such as environmental protection.

The Mekong could be the region's next hot spot if there are breaches of safety and worsening security involving armed elements. Other concerns include environmental conditions along the river and the poor livelihood of the most of the 70-million people who dwell four countries in the area. Ways must be found to improve their economic well-being, otherwise their poverty could affect public insecurity, and threaten the stability and security of the whole basin.

“China leads new security scheme on upper Mekong”, 26/12/2011, online at:
http://www.nationmultimedia.com/opinion/China-leads-new-security-scheme-on-upper-Mekong-30172638.html

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❖ Water Sales vs Environmental Activists in Hubei

When you visit Wuhan for the first time, I bet you will be impressed by the wide Yangzi river and its crazy traffic of boats carrying sand and coal up to middle China through the Three Gorges. Located in Hubei province, Wuhan is a huge conurbation composed of 3 cities (Wuchang, Hankou and Hanyang) and delimited by two of the main rivers in China: the Yangzi and the Han.

Wuhan has been famous for centuries for its large number of lakes, and especially its Eastern Lake that *"covers 33 square km"* and hosted *"the summer villa of Chairman Mao Zedong"* as the guidebook says. Hubei – which literally means "*at the North of the Lakes"* – is *the* place for water in China, while China's heart beats in Wuhan.

Citizen mobilization to protect the East Lake

But the East Lake is now famous for its dead fish. If Yu Zhengsheng, the mayor of Wuhan until 2010, always fought the idea of building on the lake, the current local administration has new projects in mind. In spring 2010, they gave authorization to OCT Holding to build a huge amusement park on this time-hallowed scenic spot of great natural beauty. A few months later and without any previous warning, a series of violent evictions begun with the local mafia kicking all the fishermen and farmers off their land. Within 3 weeks, the bulldozer arrived and started to tear down houses, filling parts of the lake with rubble.

Confronted with this urgent situation, people in the neighborhood decided on some protest actions. After a few attempts to write petitions that ended in the police raiding the petitioners' houses, the idea of a big artistic mobilization was born. First named *"Our East Lake"*, then *"Every One's East Lake* ", the movement brought together artists, researchers, architects, students and strollers over a period of several months. They started a raft of projects to protect, document and underscore the importance of such a place in Wuhan where pollution and litter are ugly and all too common sights.

A website was launched, featuring all pictures, writing, shows, debates, talks, performances and drawings that had been done (shown in the gallery below). *The Every One's East Lake* initiative has greatly raised awarness of the common fate of the inhabitants and brought great celebration to the lake banks. But even if this local issue has now spread to the national level, the amusement park project still continues apace and along with it the wanton destruction of one of China's most beautiful natural heritage sites.

The Han River: Selling water to the North

In this region of wetlands, local and international businesses have always been thirsty for more and more water. The Yangtze's longest branch, the Han river, flows from Shaanxi to Wuhan covering a distance of more than 1500 kms. It has been recently included in the colossal China South-North water project that plans to divert the waters of the Yangzi to meet the needs of dry Northern China. Indeed, Northern China is now facing desertification on an unprecendently rapid scale, and Beijing water is already 10 times under the UN scarcity level. Cities in the north can no longer sustain the water supply for their growing populations and many rivers have been diverted in an

attempt to solve this crisis. China's neighbors, India, Pakistan and Laos, have already warned the government about such practices that create catastrophic results downstream.

Yun Jianli and the Green Hanjiang Association: Determination to save the river

On a local level near Wuhan, the impact on the Han River is just as bad. The quality of the water has degraded fast in measure with its increasing scarcity along the river. In view of the great loss happening before their eyes, some villagers and scholars from Xiangfan have come together to create an association called the Green Han River to protect this priceless resource. The background of the founder Yun Jianli speaks for itself: after retirement, she decided to dedicate herself to the protection of the Han River. Using her previous experience as a teacher and CCP member, she traveled by bicycle through the district of Xiangfan looking for office space and asking for help. After visiting villages and factories, she started sending a welter of reports to local government authorities to increase public awareness and support.

"Water Sales vs Environmental Activists in Hubei", 21/12/2011, online at: http://futurechallenges.org/local/water-sales-vs-environmental-activists-in-hubei/

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❖ 12 clean water startups to watch in 2012

Summary: Systems for recovering and treating wastewater are notorious energy hogs, a concern that many of these early stage companies are hoping to address with their technology.

Like most journalists with broadly defined beats, my personal bias shows up in the coverage choices that I make. So, even though I know pretty much any storage about electric vehicles that decide to post here will drive a gratifying increase in readership, my green-tech interests in the waning days of 2011 are focused on other fundamental matters. In particular, I've been thinking a lot about which developments in green water technology I should be following during the next 12 months.

After sifting through a number of resources, I've come up with this list of start-up or early stage companies that I'll be watching as closely as possible. All of the companies on this particular to-watch list are focused on technologies for treating wasterwater, and all of them have been part of various cleantech innovation competitions this fall. I've organized the list alphabetically and offered my brief rationale for planning to watch each company.

1. APTWater (Long Beach, Calif.): Treats wastewater with an eye toward enabling reuse. The company merged with Europe's Rochem in November 2011 and boasts several municipal deals on its Web site.
2. aquaMost (Madison, Wis.): Uses ultraviolet light and patented catalysts to purify water. In late November 2011, the company snagged $3 million in a second round of venture capital; it was also awarded a $1 million phase II Small Business Innovation Research grant by the National Institutes of Health.
3. Aqwise (Israel): Develops biofilm technologies to remove nutrients, carbon and other substances. Has municipal pilot history in the United States and Spain.
4. Arbsource (Tempe, Ariz.): Makes a reactor system designed to be used by food and manufacturing companies.
5. Emefcy (Israel): Creates energy-efficient water treatment technology by using sewage-eating bacteria. In August 2011, the company snagged about $10 million in venture funding from GE, NRG Energy and ConocoPhillips.
6. Fogbusters (Oakland, Calif.): Takes the FOG (fats, oil, grease) out of wastewater. Customers included Cadbury and United Biscuits.
7. Magpie Polymers (France): The spinoff from Ecole Polytechnique focuses on treating heavily contaminated industrial wasterwater.
8. Nexus eWater (Australia): Bills itself as maker of technology that can recycle graywater to a near potable condition, while also offering an alternative for reducing hot water energy costs. The company snagged two Australian grants in August 2011.
9. Ostara Nutrient Recovery Technologies (Vancouver): Removes nutrients from wastewater and converts that into fertilizer than can be used by a revenue source. The venture capital-backed company has three recovery facilities in the United States and recently authorized one for Saskatoon, Canada.
10. Pasteurization Technology Group (San Leandro, Calif.): Develops a wastewater disinfection system that creates renewable energy as its works. The company says it is poised to commence commercial shipments of its flagship product during 2012.

11. Puralytics (Beaverton, Ore.): Uses nanotechnology, optics and light to purifying water.
12. Vorsana (Portland, Ore.): Employs the concept of "radial counterflow" to create more efficients systems for water treatment, as well as separating flue gasses.

"12 clean water startups to watch in 2012", Heather Clancy, 27/12/2011, online at: http://www.zdnet.com/blog/green/12-clean-water-startups-to-watch-in-2012/19812

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Dow at the forefront of Saudi water sustainability program

JEDDAH – In a country where water is as precious as gold, providing uninterrupted supply of water takes center stage, especially amid the rapid expansion of Saudi Arabia's population and industrial development.

Saudi Arabia's Saline Water Conversion Corp. (SWCC) produces 3.36 million cubic meters of desalinated water per day, a daily cost of SR8.6 million based on the SWCC's 2009 figures when the cost of producing one cubic meter of desalinated water was SR2.57. Transporting it added an extra SR1.12 per cubic meter.

The Saudi Minister of Water and Electricity Abdullah Al-Hussayen has said earlier that water demand is rising by more than seven percent annually, and that more than SR500 billion ($133 billion) of investment in the water and power sector will be required over the next decade.

Against this backdrop, the Dow Chemical Company, which has a 50-year history of innovation and market leadership in the water industry, has pledged to spearhead the building of a new world-class reverse osmosis membranes facility in the Kingdom that would deliver cutting-edge technologies for water desalination and water re-use for potable, non-potable and industrial water.

A senior Dow executive told the Saudi Gazette that the company is committed to providing Saudi Arabia with sustainable quality water using the latest innovative solutions. The following are excerpts from an interview with Ilham Kadri, Commercial Director, Dow Water & Process Solutions (DW&PS), Europe, Middle East & Africa (EMEA):

Based on your study about the Kingdom's sources of water, i.e, from scarce ground water and seawater, why do you recommend reverse osmosis as the best water treatment method, aside probably from pioneering that solution? Why not the other methods like distillation and filtration such as solid block activation carbon? How cost-efficient is RO? Can you quantify it, e.g. for every gallon of "waste" water treated using RO, how much of it is left as produced filtered water?

When evaluating the treatment of water, regardless of the source, a number of treatment options need to be looked at in order to select and optimize the technology to be used. Typically, evaluations are based on factors such as product quality, energy consumption and capital expenditure, among others. Reverse Osmosis (RO) technology scores high in comparison with other desalination technologies, in particular thermal distillation processes such as Multi Stage Flash distillation when the true cost of energy is taken into account.

In the last 10 years, with the desalination and water re-use boom in the world, RO membrane technology became the technology of choice due to the tremendous savings in capital expenditure and energy consumption. In parallel with the innovations in pre-treatment technologies and chemicals performance, the integrated system became much more cost-effective and far more sustainable in productivity and quality while maintaining a clean environment with the lowest possible emissions.

Some experts say that compared to other methods, RO requires water pressure, is fairly slow and typically wastes more water than it treats. Are their observations true?

RO does require pressure but this in fact is an advantage. RO simply produces fresh water from sea

water or saline aquifer waters by applying pressure with no phase change required, which means that, thermodynamically, RO is a more efficient process than distillation processes that require the conversion of liquid water to steam or vapor then condensed back to desalted liquid water with all of the thermodynamic losses this entails.
As for the speed of the process, RO is a continuous operation and the separation is instantaneous. Additionally, another key advantage due to the continuous operation is the footprint (or amount of land) required to produce a given volume of fresh water. RO is well known to require less land and therefore RO usually judged to be a more intensive process.
The issue of wasting water varies depending on many variables such as water chemistry, water physical parameters, and others. In RO, we describe this as RO Recovery Rate, meaning the percent of freshwater that can be extracted from the feed/raw water. RO Recovery varies between 45 percent in seawater to 95 percent in municipal water. In thermal desalination processes, we see high recoveries (up to 50 or 60 percent), however, a massive amount of the fresh water produced will be re-used to cool the system which reduces the net recovery to 10-15 percent.
On the other hand, the reject that is sent back to the sea is far higher in temperature in thermal desalination compared to RO, which leads to extra costs and energy to cool the reject water. This is becoming more of a challenge to overcome globally. In the Middle East region, we can see the Arabian Gulf water temperature reaching the level of 40 degrees Celsius. Such temperatures offer a favorable environment for the growth of micro-organisms, bacteria, algae, etc.

Is the produced filtered water through RO already potable? If yes, how pure and safe is it compared with the filtered water using the other methods?
Due to the wide range of models of RO membranes available, RO technology meets the most stringent water quality standards currently imposed, whether they are international standards such as the World Health Organization (WHO) or the national quality standards as are often used in Saudi Arabia.
However, post-treatment is always required to tune the final quality in terms of pH, salts adjustment and balance like Calcium and Magnesium. Compared to RO, thermal desalination depends on evaporation or steaming so a more extensive post-treatment will be required to achieve the required potable standards.
In Saudi Arabia, the product of the thermal process is usually blended with RO product water to balance the salt levels to meet the potable water characteristics. As an example, the Jubail MSF Water feeding Riyadh City is blended with water from Al Wasia plant and Se'ed wells.

Does RO function in the same way whether it be industrial and municipal water, industrial processes, pharmaceuticals, power, or residential water?
This is one of the key advantages of RO. The process is so flexible which makes it applicable in the same manner in all of the above applications. What needs to be considered is selecting the best fit membrane to the source and quality of the water.
A key parameter to consider when selecting the membrane model for municipal drinking water is

where it is usually required to be tested and certified by regulatory bodies such as the NSF for products sold in Saudi Arabia.

What are the advantages and benefits of applying the RO solution as compared with the other two mentioned above?
The advantages include reduced costs, reduced energy consumption, lower environmental impact, less land required and an increased flexibility in operation. Also, Saudi Arabia remains reliant on the traditional more energy-intensive thermal technology versus the more advanced spiral wound RO technology. There is a real missed opportunity here because the energy that goes into the thermal process actually translates to lost resources availability and profits for future generations.

What are the disadvantages of RO? How do you address these limitations?
There are no obvious disadvantages since the RO membrane is part of an integrated process that starts at the intake, through the filtration pre-treatment and ending with the post-treatment and distribution. The challenge is how to best integrate the system to overcome new challenges in the water quality such as turbidity, red tides, temperature, and so on. In the past, it has been necessary to take some RO plants off stream during times of excessive turbidity, red tide events, large oil spills or temperature increase. The development of advanced pre-treatment processes such as Dissolved Air Flotation and the increasing use of Ultrafiltration upstream with innovation in chemicals technology of RO membranes and chemicals used managed to reduce the impacts of such events with minimizing future plant downtime events.
For example, the added values of integrated Ultrafiltration - Reverse Osmosis (UF/RO) systems, such as reducing footprint and emissions, increasing net recovery with maintaining sustainable performance - created more tendency from key users to apply the technology for industrial water reuse and desalination applications.

When will you start the construction of the manufacturing facility for DOW FILMTEC Reverse Osmosis (RO) elements in the Kingdom? What is the sharing arrangement with the Saudi government? What is its estimated cost? Its expected production capacity? Would it train and employ Saudis? What percentage would they be of the total workforce? What is the size of the workforce?
We are very excited about our upcoming RO investment in Saudi Arabia, and we were pleased to see our customers and local partners sharing in our excitement at the recent Saudi Water & Power Forum. We have not yet announced the start date of the construction of the new manufacturing facility. What I can I can tell you is that engineering on this project has already begun, and we expect to be operational by 2015 latest.
In terms of estimated capacity, Dow does not disclose those figures externally. But I can tell you that at this stage, we're looking at quite a large investment. And to give you an idea of the significance of this investment, this is not only the first Dow RO membrane manufacturing facility outside the United States, it's also the first ever such facility in the entire ME&A region.
We have been actively engaged with key stakeholders in the Saudi government even before we

announced our intention to invest in Saudi Arabia. Those dialogues about mutually-beneficial areas of collaboration remain ongoing. One of our points of discussion is in fact local job creation, which Dow is committed to through this investment.
We'll be looking to have the right mix of Dow manufacturing, commercial and technical experts, as well as local talent, for the facility. This is also a first for Saudi Arabia in terms of having access to highly specialized manufacturing jobs because the facility will employ the latest manufacturing processes. We will train Saudis both inside and outside the Kingdom and we will encourage education and learning through promoting specific curriculums in schools, colleges and universities early enough in the process.
We are proud and privileged to be a partner of Saudi Arabia as it invests in the growth and talent development of its people. In recent years, the government has made significant investments in enhancing knowledge and education, as is evident in institutions such as the Princess Noura University, Al Mandia Knowledge City and the King Abdullah University of Science & Technology (KAUST). In fact, Dow and KAUST have been partners for nearly three years now. Today, the Dow Middle East & Africa R&D Center at KAUST is conducting research on water treatment and processing, research that is critical to the needs of the Kingdom. We've also identified talented new Saudi employees who've joined Dow since we partnered with KAUST, both in the Kingdom and abroad. We firmly believe that Dow's success in Saudi Arabia is tied to the development of the young people of Saudi Arabia, and that's part of the reason that we decided to invest in KAUST.

What about the opportunities/outlook for Dow in Saudi Arabia in the coming 2 years?
Overall, Saudi Arabia offers tremendous benefits to investors, thanks in part to its stable economy, which has proven resilient throughout the global financial crisis. This has encouraged many investors to take a closer look at the Saudi market and to build a stronger presence locally.
In terms of the specific business opportunities for Dow Water & Process Solutions, as I'm sure you know, Saudi Arabia is the largest desalination market in the world. If you factor in the population growth rate and the ambitious investments being made to develop infrastructure, you have a very attractive market for our solutions, be it for seawater desalination, industrial or municipal water reuse. We should also not forget the growing water reuse segment.

What are the challenges facing Dow in this market?
In our industry specifically, we believe that the first key challenge is the overall awareness about the technology and what it can do today for the Kingdom and for future Saudi generations. We want to continue to raise awareness about water scarcity and the type of modern technologies available to the water players to adopt cost-effective and low-energy RO and UF technologies. We believe that if the more abundant oil resources can be allocated for uses other than treating water, then it can only be beneficial for the Kingdom and future generations. We also believe that if we can reuse waste water, then it is no longer a waste.
The second challenge we face is a technical one. The quality of raw water is becoming worse and availability is less. It is our core responsibility to rapidly develop our innovations and technologies to

meet future demand today in terms of raising the Recovery Rate while ensuring sustainable quality and productivity. That's why we are coming closer to this market, to better understand the needs and the unmet needs, and we will provide the right solutions through a local R&D facility and a local manufacturing asset.

"Dow at the forefront of Saudi water sustainability program", Querubin J. Minas, Saudi Gazette, 30/12/2011, online at. http://www.saudigazette.com.sa/index.cfm?method=home.regcon&contentID=20111226114415

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❖ WASSER Berlin 2013 Focuses on the Middle East

From April 23-26, 2013, at WASSER BERLIN INTERNATIONAL, for the first time the focus will be on the Middle East.

Founded in 2009, the Arab Countries Water Utilities Association (ACWUA) will be the official partner of the fair. It represents 17 Arab countries. Its members are Algeria, Morocco, Tunisia, Mauritania, Libya, Egypt, Syria, Lebanon, the Palestinian territories, Jordan, Iraq, Kuwait, Saudi Arabia, Bahrain, the UAE, Oman and Yemen. The association is based in Amman in Jordan.

These countries not only have the same language in common, they are also faced with the same problems concerning water. Among these are a lack of resources while populations expand, emergent large conurbations, i.e. megacities, an inadequate infrastructure for water supplies and wastewater disposal, and the inability of water rates to recover costs, all this against a backdrop of high investment costs and a shortfall in specialist workers. These topics are the key focus of ACWUA.

Alongside the latest projects these are the topics that will be discussed at various forums and workshops during the fair. The association also plans to host a combined display of the Arab countries. Numerous high-ranking delegations will round off this collaboration.

"This partnership opens up new market opportunities for our exhibitors. German companies already maintain a wide range of business ties in Arab countries which need to be extensively developed", says Cornelia Wolff von der Sahl, the project manager of WASSER BERLIN INTERNATIONAL.

In addition to companies representing all branches of the industry and the fair's international dimension, the accompanying congress WASSER BERLIN INTERNATIONAL will also be of great benefit to ACWUA. The association regards itself as a regional platform for knowledge transfer and for advising on best practices. It offers its members a variety of training programs and hosts conferences such as the Arab Water Week in Amman.

"WASSER Berlin 2013 Focuses on the Middle East", 28/12/2011, online at:
http://www.trenchlessonline.com/index/webapp-stories-action?id=2056

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❖ Smart ways to save water

Despite being one of the driest countries in the world, Saudi Arabia is among the highest globally in per capita water consumption. According to statistics, the average water consumption was about 235 liter per person per day in 2006, but individual consumption levels continue to increase year after year. This, combined with the rapid population growth in the Kingdom — estimated to reach 50 million in 2050 — makes water conservation at home an essential practice.

According to Karin Kloosterman, founder and editor of the website Green Prophet that covers Middle East green news on various topics, it is not difficult to save water at home. "Some of the easiest things will save you money too," she told Arab News. "Leaky toilets, for instance, are a huge water waste. Tiny drips inside the toilet bowl can eventually fill swimming pools."

Kloosterman advises people to buy a dye-based toilet cleaner that lasts about a month and hook it onto the bowl to check if your toilet is leaking. "If there is a leak, you will see a stream of color on the side of the bowl," she said, adding that leaks look shiny.

The same goes for leaking taps and pipes. Check these from time to time and fix them if necessary. A tap that drips 10 times a minute may not seem like a big deal, but can cost you 2,000 liters yearly.

"In the kitchen," Kloosterman continued, "you can save water by placing faucet aerators on the sink. These force less water through the taps, while giving you the same pressure when you are cleaning your hands, vegetables and rinsing dinner plates before washing them."

Using water more efficiently and avoiding water waste is in line with Islamic water management principles, writes eco-Muslim Zaufishan on Green Prophet. Prophet Mohammad (pbuh) already warned against squandering water, even if next to a flowing river. Muslims can make a difference by using less water while performing wudhu (ablution) before prayers. Her "eco-wudhu" goes like this: Instead of keeping the water running, fill a small pot or bucket while making wudhu and use a glass to rinse your mouth.

Zaufishan also recommends checking your wudhu count. "For experimental purposes, time how long it takes for you to complete wudhu while leaving the tap running on normal pressure. Next time, place a bucket under the tap and leave the tap running for the same amount of time it took for you to do wudhu. Measure this water. This is your wudhu count," she explains on the website.

Turning off the tap is also a good idea when brushing your teeth, shaving or soaping yourself in the shower. Use a glass of water to rinse your mouth and do the same for dipping your razor.

Reducing the time of your showers or taking fewer showers also makes a big difference, remarked Kloosterman. "In the heat of the Middle East, avoid going out during the hottest times of the day to avoid breaking out in a sweat. That way you will take fewer showers."

However, if you do not want to cut back on showers, taking shorter showers is still very effective. Statistics show that showering one minute less daily saves up to 3,000 liters of warm water a year.

There are numerous other ways to save water. Buying a bucket can be very handy. Use it to save the water you would otherwise waste waiting for it to warm up to take a shower. This water can be used to wash dishes, clean fruits and vegetables, fill the toilet tank, water the plants or wash your car. Using a bucket to clean your car instead of a hose makes a big difference in the amount of water needed. If necessary, only use the hose — with a spray nozzle — for rinsing.

Most new toilets have a water-saving button, but if you have one that doesn't, place a 1.5 liter bottle filled with water inside the tank. You will save this volume every time you flush the toilet.

If you are one of those fortunate people with a lush, green backyard, make sure you water your lawn either before sunrise or after sunset. This way, a minimum amount of water evaporates, and the sun won't burn your plants. It is also better to water your yard less frequently but longer rather than every day. This encourages deep root growth and drought tolerance.

We all like the driveway and sidewalk in front of our house to be neat, but why not use a broom instead of a hose to clean them? You will save up to 17,000 liter of water a month only with this!

Make sure you only run your clothes washer as well as dishwasher fully loaded. "Some washing machines have water savings programs," said Kloosterman. She also noted that you could recycle the "wash" water from some of the less soiled clothing and use it for the heavily soiled stuff. "Don't worry," she added, "you will always get a clean rinse."

Wash your fruits and vegetables in a pan of water instead of running water from the tap. Reuse this to water your plants or to fill the toilet tank. And if you need to thaw food, do not use running water, but defrost it in the fridge. This is also more hygienic and might even help you save some energy, as the frozen food slightly cools your refrigerator.

Overall, try to reduce the amount of water that flows down the sink. Whenever you use water, think if there are ways to collect and reuse it. Often, this water is clean enough to reuse it for the toilet, your lawn, houseplants or your car. Some changes you make may seem small, but all together they will help you save a lot of water and money.

"Smart ways to save water", Selma Roth, 27/12/2011, online at:
http://arabnews.com/lifestyle/food_health/article554739.ece

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❖ Groundwater dropping globally

Groundwater levels have dropped in many places across the globe over the past nine years, a pair of gravity-monitoring satellites finds. This trend raises concerns that farmers are pumping too much water out of the ground in dry regions.

Water has been disappearing beneath southern Argentina, western Australia and stretches of the United States. The decline is especially pronounced in parts of California, India, the Middle East and China, where expanding agriculture has increased water demand.

“Groundwater is being depleted at a rapid clip in virtually of all of the major aquifers in the world's arid and semiarid regions,” says Jay Famiglietti, a hydrologist at the University of California Center for Hydrologic Modeling in Irvine, whose team presented the new trends December 6 at a meeting of the American Geophysical Union.

Famiglietti and his colleagues detect water hidden below the surface using the modern equivalent of a dowsing rod: a pair of car-sized satellites, nicknamed Tom and Jerry, that are especially sensitive to the tug of gravity from below.

This joint mission between NASA and the German Aerospace Center called the Gravity Recovery and Climate Experiment, or GRACE has been creating monthly snapshots of global groundwater since 2002. The trends now identified in this data help fill in monitoring gaps and confirm problems in places where official groundwater information is unreliable or nonexistent.

“GRACE is very good for areas of the world where we don't have good ground observations,” says Marc Bierkens, a hydrologist who studies groundwater at Utrecht University in the Netherlands.

China, for example, has been shown to underestimate groundwater use. The country lacks the nationwide network of monitoring wells found in the United States. GRACE's measurements suggest that water levels have been dropping six or seven centimeters per year beneath plains in the northeast.

In some areas, short-term climate variability may be to blame. For example, the plains of Patagonia in Argentina and areas across the southeastern United States areas that have been hit hard by droughts store less groundwater today than they did in 2002.

But there's little doubt as to what's behind the biggest drops: farming. An agricultural boom in northern India has helped to squeeze nearly 18 cubic kilometers of water from the ground every year (SN: 9/12/09, p. 5). That's enough water to fill more than seven million Olympic swimming pools. And in California's Central Valley, which supports about one-sixth of the nation's irrigated land, the ground has been sinking for decades as landowners drill more wells and pull out almost 4 cubic kilometers of water per year (SN: 1/16/10, p. 14).

“People are using groundwater faster than it can be naturally recharged,” says Matthew Rodell, a hydrologist and GRACE team member at NASA's Goddard Space Flight Center in Greenbelt, Md.

Agricultural pressures are particularly worrisome in places like the Middle East, another hotspot on the new GRACE map. Water pumped out of the Arabian aquifer beneath Saudi Arabia and surrounding countries today fell as rain thousands of years ago. Once this fossil water disappears, there's little new rainfall to replenish it.

Climate change will only worsen the problem, says Famiglietti. Precipitation patterns are becoming more extreme, increasing the severity of droughts. Wet areas are also becoming wetter and dry areas drier, which may accelerate declines in groundwater in some places over the coming years.

But even as the researchers sound the alarm, they don't know how loud to crank up the volume. GRACE reveals only changes in groundwater. It doesn't divulge how much water is left.

“We don't really know how stressed the world's largest aquifers are,” says Sasha Richey of the University of California Center for Hydrologic Modeling.

Some reservoirs, like the giant Nubian Aquifer that underlies North Africa, may be large enough to meet demand for centuries. But few reliable estimates exist of the amount of groundwater stored in the world's aquifers.

Despite the uncertainties, Leonard Konikow, a hydrogeologist at the U.S. Geological Survey in Reston, Va., says that water use has become unsustainable in many places. Better irrigation systems that use less water could help to curb the problem, he says. So could channeling water during especially wet periods into aquifers instead of letting it run off into the ocean.

“There are too many areas in the world where groundwater development far exceeds a sustainable level,” says Konikow. “Something will have to change.”

“Groundwater dropping globally”, 27/12/2011, online at: http://www.thedailystar.net/newDesign/news-details.php?nid=215802

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❖ Finally – A Team of Experts to Evaluate Impact of Massive Ethiopian Dam

The politics surrounding Ethiopia's Grand ~~Millennium~~ Renaissance Dam changes only slightly more frequently than the project's name, and we are excited to bring you one of the most positive updates since the saga began. Ethiopia has being posturing against Egypt's historical monopoly of the Nile river's waters for months, even though the country lacks the funds to see a potentially environmentally destructive 5,250MW dam to completion without help.

Loyal Ethiopians unaffected by urging from UNESCO to halt another dam contract awarded to a similar consortium of cronies accused us time and again of turning a blind eye to their distressing energy poverty. But that was never the case. We have always advocated for a fair distribution of the Nile river, as well as for a thorough investigation of the project's potential environmental impact. We may finally have received our wish, but it's probably not as altruistic as it seems.

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Egypt's Nile Basin tour

According to our friends at *Almasry Alyoum*, Egypt's Foreign Minister Mohamed Kamel Amr will take a tour of six Nile Basic countries in the second week of January.

Nile Basin Coordinator Maddy Amer said in a statement that solving the Nile river issue is top priority for the country that is still struggling under the weight of political mayhem.

Amer added that while Egypt has not changed its position on the Nile dam, it won't accept an Ethiopian solution that jeopardizes either Sudan or Egypt, and that Ethiopia has to cooperate if it hopes to receive any funding.

If the dispute over Nile waters has not been settled, then aid groups will be unwilling to put forth financial assistance.

Impartial assessment

But the most promising development we've seen is the commitment from Addis Ababa, Cairo, and Khartoum to finally prepare a technical report that evaluates the potential impact of Ethiopia's Grand Renaissance Dam.

6 experts – two from Egypt, Ethiopia, and Sudan – will choose an additional 4 international experts to help them conduct a year long study that is expected to start as soon as next month.

The team of 10 experts should be able to produce an impartial scientific document which lays out exactly what is at stake if the dam is allowed to continue – without favoring any one country.

One hopes that up and downstream ecological consequences will be considered, as well as the potential effects that climate change will have in the future.

Ethiopia needs power, everyone needs water, but there must be a way to accomplish this without hasty planning. This recent news gives us hope that finally this dispute is taking a constructive, diplomatic turn.

"Finally – A Team of Experts to Evaluate Impact of Massive Ethiopian Dam", 27/12/2011, online at: http://www.greenprophet.com/2011/12/evaluate-impact-ethiopias-dam/

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