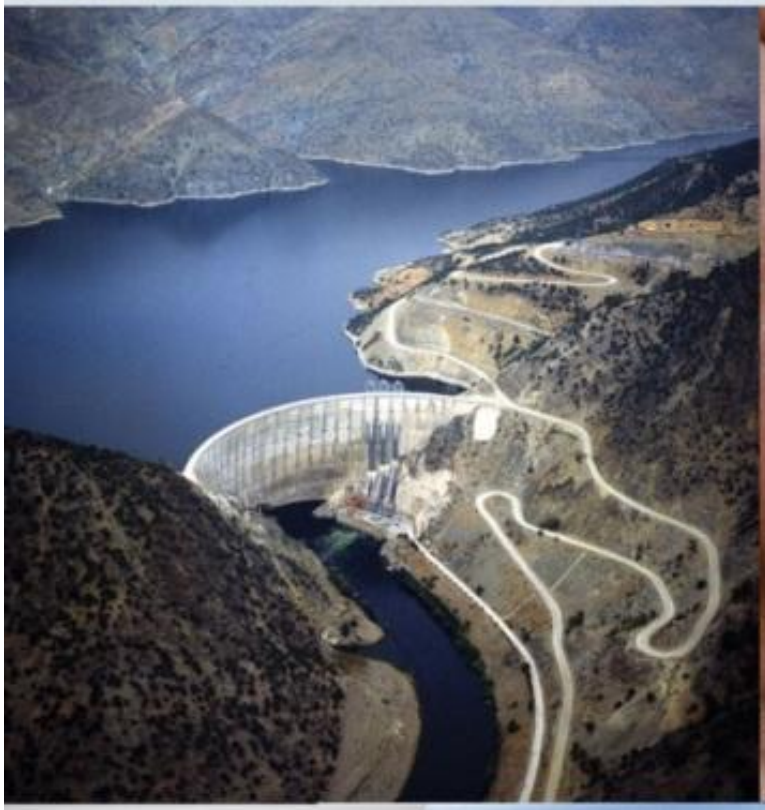


# ORSAM WATER BULLETIN

Weekly Bulletin by ORSAM Water Research Programme

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





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# ORSAM WATER BULLETIN

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### ❖ 20% Rise in Power Output of Iran's Hydroelectric Power Plants

"The power generation of hydroelectric power plants in the water year of 1391-1392 (fall of 2012 to fall of 2013) stood at over 12,500kw/h which shows a 20% growth compared to the same period in the last water year," Managing-Director of Iran Water and Power Resources Development Company Seyed Mohammad Reza Rezazadeh told FNA today.

Asked about his assessment and prediction for the volume of power generation in the new water year in Iran, he said rough estimates show a good trend, but everything depends on the amount of waterfalls in the fall and winter.

Hydroelectricity is the term which refers to electricity generated by hydropower; the production of electrical power through the use of the gravitational force of falling or flowing water. It is the most widely used form of renewable energy, accounting for 16 percent of global electricity generation – 3,427 terawatt-hours of electricity production in 2010 and is expected to increase about 3.1% each year for the next 25 years.

Hydropower is produced in 150 countries, with the Asia-Pacific region generating 32 percent of global hydropower in 2010. China is the largest hydroelectricity producer, with 721 terawatt-hours of production in 2010, representing around 17 percent of domestic electricity use.

The cost of hydroelectricity is relatively low, making it a competitive source of renewable electricity.

"20% Rise in Power Output of Iran's Hydroelectric Power Plants", 13/10/2013, online at: http://english.farsnews.com/newstext.aspx?nn=13920721001005

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### ❖ Official says 84 percent of Iran's total area dry or semi-dry

84 percent of Iran's total area is either dry or semi-dry, while only only 16 percent of the country is humid and semi-humid, Deputy Energy minister of Iran, Sattar Mahmoudi said, Mehr news agency reported.

Speaking about the renewable water resources in Iran, he named the number of 130 billion cm, 92 billion cm of which are underground water resources.

Mahmoudi added that there are about 609 plains in Iran, and 253 of those are in such condition that it is impossible to get water off of them.

Iran continues to have struggles with droughts and dry climate. In the recent years, the country has experienced several droughts in recent years, especially in the south where it gets hit by violent sand storms that engulfed several cities.

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

"Official says 84 percent of Iran's total area dry or semi-dry", 12/10/2013, online at: http://en.trend.az/regions/iran/2200708.html

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### ❖ Will Syrian refugees transform or threaten Jordan's economy?

Christian Science Monitor- Syrians fleeing civil war are straining Jordan's resources, but they are also filling a gap in the economy as they set up small businesses and take jobs that Jordanians won't.

It's early in the day, before the afternoon rush, so the server at one of Jordan's newest shawarma stands takes time to carve a carrot into a reasonable representation of a rose before presenting a platter of marinated and grilled chicken slices to a customer.

The fast food restaurant, Enis Chicken, is one of the latest Damascus imports to Amman. Just down the street is the Syrian shop Bakdash, where the rhythm of wooden paddles beating against metal tubs rings out in tune with a centuries-old recipe that turns milk, rose water and Arabic gum into ice cream.

The shawarma stand, competing with a shop selling the more basic local version of the chicken sandwich nearby, is part of a wave of Syrian entrepreneurship that both promises and threatens to change the face of Jordan.

Over the past two years, an estimated 1 million Syrians have fled fighting in their homeland for their tiny neighbor, the latest of several waves of refugees from Jordan's neighbors – Palestinians at various points since Israel's founding, Iraqis in the wake of the US invasion, and now, Syrians. Fewer than half of those are in Zataari, the desolate, still-growing refugee camp that is now Jordan's fourth biggest city.

"The people of Jordan were very much against us being here," says Madian al-Jazerah, a business owner who was among the wave of Jordanians of Palestinian origin who resettled in Amman after being expelled from Kuwait in 1991. "Now with the Syrians it's the same pattern."

Faced with the biggest refugee crisis in the region since the creation of Israel in 1948, the Jordanian government has warned that its population of 6 million population won't be able to absorb more Syrian refugees and that the influx is a dangerous drain on resources. Jordanians slammed by higher

prices for fuel, electricity, water and consumer goods due to the lifting of government subsidies are blaming the Syrian refugees for disappearing jobs and rising prices.

During the 2003 war in Iraq, poorer Iraqis fled to Syria – the only place they could afford to live. Those Iraqis who sought refuge in Jordan tended to be well-educated and many of them wealthy – building and buying large companies and creating jobs.

The Syrians – who are setting up small businesses and working in shops, restaurants and construction – are a different breed.

"The Iraqis definitely had money," economist Yusuf Mansur says. "The Syrians are more craftspeople. They come from a socialist economy in a country that was large, diverse and closed for the longest time and because they were closed they learned to do things."

Filling in the gaps

Wedged between Iraq, Syria, Saudi Arabia, Israel and the Palestinian territories, Jordan has little water and few other natural resources. But it has parlayed its traditionally close relations with the United States and its position as a buffer state between Israel and the Arab world – and as a major recipient of refugees – into foreign aid that is its biggest source of income.

Many of the products sold in Jordan – from clothing and food to inlaid wooden boxes and handmade glass-- were Syrian. Until the 1990s, a ban on imported cars filled Damascus streets with vehicles from the 1950s and 60s kept running through ingenuity.

"We were originally nomadic raiders," says Mansur, referring to Jordan's original Bedouin population. "The Syrians were traders."

Mansur disputes government figures that indicate the refugees are draining limited resources to a critical level, saying that those living in trailers and tents consume far less water and electricity than Jordanians. Without the influx of refugees spending money in the most impoverished areas of Jordan,

he says, the kingdom's sluggish growth rate – estimated at 2 to 3 percent – would be even lower.

Most of the Syrians work in Jordan's "unofficial sector." At one Amman shopping mall, a Syrian salesman who says he works a seven-day week for the equivalent of $350 a month said he had been fined four times for working illegally.

Getting a work permit "would cost me two months rent," he says.

Many Jordanian business owners taking advantage of cheaper, experienced labor have dropped the wages they are offering. But business owners say the Syrians offer skills that Jordanians don't have and like Egyptian laborers in the country, are willing to take jobs Jordanians don't consider respectable.

Mr. Al-Jazerah, who employs more than 60 people at two branches of his books@cafe restaurants, says he pays expatriate workers the same as his Jordanian employees. His waiters include a Syrian architect.

"Jordanians have finally accepted to be waiters," he says. "Are they willing to sweep floors, are they willing to be a guard in an apartment building, are they willing to wash dishes? No. "

Adding flavor

Damascus, one of the world's oldest continuously inhabited cities, was on the silk road trade route and once the capitol of a powerful Islamic empire. Its cuisine and its culture also bear more recent traces of its legacy of a French protectorate.

At the shawarma shop, the simple chicken sandwich rolled in paper-thin bread is marinated in pomegranate syrup and scented with lemon and cardamom. It costs less than $2. The owners opened a branch in Amman earlier this year after two of their Damascus restaurants were destroyed.

"Syrians and the people of Damascus in particular are known for their food. It feeds the soul," says

Ayman al-Sayid al-Lahem, one of the owners.

Although it's meant as fast food, the demand is so high that in the early evening, customers wait on the sidewalk for up to half an hour for the sandwiches.

"These people can bring in so much. I'm finally hoping to see good carpentry for instance, or good glass blowing, or just good sweets," Jazerah, the business owner, says. "They're bringing in culture and that's what people don't see – they're just adding to our spice."

"Will Syrian refugees transform or threaten Jordan's economy?", 13/10/2013, online at: http://en.ammonnews.net/article.aspx?articleno=23291#.UlrnoNJyszE

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### ❖ In electricity-starved Iraq, everyone knows his amps from his watts

Power cuts, shortages have gone on for so long that most Iraqis turn to generators to make up for lack of national grid electricity making juggle of electrical appliances second-nature.

BAGHDAD - In electricity-starved Iraq, just about everyone knows his amperes from his watts, and juggling electrical appliances to run them off a generator is by now second-nature.

Power cuts and shortages have gone on for so long that most Iraqis turned to generators to make up for the lack of national grid electricity.

"In Iraq, there isn't a single home without a generator... from the most simple abode to the most remote tent," says Abu Karar al-Quraishi, who sells small generators in central Baghdad.

"And in villages, generators are often as important as food" because they run water pumps needed for agriculture.

But the personal generator business is not what it used to be, and while the government trumpets rising power supplies, most people still require plenty of supplementary electricity.

As time has gone on, many city dwellers have switched to private generator operators who, for a fee, will provide power to a single building, or an entire street, when the national grid is down.

"From 2006 to 2010, I used to sell 100 to 150 generators a day," says Quraishi. "Since 2011, sales have dropped and I only sell 10 to 15 a week."

"People prefer buying power from private generator operators because they do not need to buy fuel, change the oil, or otherwise maintain their own generators. It's easier to let generator operators handle the problems."

Selling electricity can be good business.

Abu Sajad, a generator operator near Aqba bin Nafia Square in central Baghdad, operates two 500 Kilovolt (Kv) generators from a shack, and guarantees up to 18 hours of electricity a day to his 150 neighbourhood customers.

"It is a hard job," says the 37-year-old, who previously worked as a car painter and taxi driver.

"You must be on hand day and night to keep an eye on the cables and make sure the generator does not overheat.

"And if the generator shuts down for half an hour you can be sure the customers will be all over you complaining."

Three amps and TV is on

During the hot summer, prices are fixed by the government which, in exchange, subsidises the fuel needed to run the generators.

In the winter, generator operators pay market rates for fuel, but consumption typically drops as temperatures cool off and Iraqis have less use for their air conditioners.

But even though the government sets prices during the summer, charges vary on the ground.

Sajad charges 12,000 Iraqi dinars ($10) per ampere per month, with a minimum three-ampere contract. Operators in other neighbourhoods, however, charge as little as 7,000 dinars per amp per month.

Three amps, a measure of current, will be enough for a small fridge, a television, a fan and some lights. Ten amps will allow for an air conditioner, and more lights.

When customers exceed their allotment, power automatically shuts off.

That means they must learn to juggle appliances -- turning off the television to use a microwave, or shutting everything down to ensure there is enough power to run a small air-conditioner in the summer heat.

From inside his shack where a generator thunders away, Sajad keeps a close eye on the meters.

A maze of cables, which could easily prove a fire hazard, sprouts from the shack into a spidery web which runs off to nearby houses.

Sometimes the jumble of cables outside allows a thief to "hook on" undetected to a wire to steal a few amps here and there. Others just steal the wires themselves.

'I couldn't live without my generator'

Officials have poured in billions of dollars since the 2003 US-led invasion to solve the power problem, caused by decades of war and sanctions which led to a reliance on obsolete technology.

And while things are slowly getting better, few actually believe government promises that Iraq will produce more electricity than it consumes by year-end.

Such a date is "unrealistic" according to Suzan al-Saad, a member of Iraq's parliamentary oil and energy committee.

"There are still many technical obstacles to overcome."

Saad pointed in particular to a decision to build gas-powered power plants, despite the lack of domestically-extracted gas.

While Iraq sits on a sea of oil, it produces hardly any gas and the little that is extracted, as a byproduct of crude, is "flared off" rather than captured.

The widespread corruption plaguing Iraq is also said to have hampered electricity provision.

According to electricity ministry spokesman Musab al-Mudaris, the national grid now provides 14 hours of electricity per day in Baghdad, and up to 20 hours per day elsewhere in the country.

Many Iraqis would dispute those figures.

Production currently stands at 11,000 megawatts (MW), and is estimated to increase to 13,000 MW by year-end and 20,000 MW by late next year, says Mudaris.

Peak summer demand is pegged at 16,000 MW, and Mudaris says the ministry hopes to meet that demand next year.

But Iraqis aren't letting go of their generators just yet.

"I couldn't live without my generator," said Maria Hawil, a 58-year-old Baghdad housewife who has been using the same one for six years.

"It goes wherever I go."

“In electricity-starved Iraq, everyone knows his amps from his watts”, 10/10/2013, online at: http://www.middle-east-online.com/english/?id=61893

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### ❖ CHELLANEY: The coming water wars

As competition for the precious resource grows, water will be a key to war and peace

In an increasingly water-stressed world, shared water resources are becoming an instrument of power, fostering competition within and between nations. The struggle for water is escalating political tensions and exacerbating impacts on ecosystems. The Budapest World Water Summit, which opens Tuesday, is the latest initiative to search for ways to mitigate the pressing challenges.

Consider some sobering facts: Bottled water at the grocery store is already more expensive than crude oil on the spot market. More people today own or use a mobile phone than have access to water-sanitation services.

Unclean water is the greatest killer on the globe, yet one-fifth of humankind still lacks easy access to potable water. More than half of the global population currently lives under water stress — a figure projected to increase to two-thirds during the next decade.

Adequate access to natural resources, historically, has been a key factor in peace and war. Water, however, is very different from other natural resources. A person can live without love, but not without water.

There are substitutes for a number of resources, including oil, but none for water. Countries can import, even from distant lands, fossil fuels, mineral ores and resources originating in the biosphere, such as fish and timber. However, they cannot import the most vital of all resources, water — certainly not in a major or sustainable manner. Water is essentially local and very expensive to ship across seas.

Scarce water resources generate conflict. After all, the origin of the word “rival” is tied to water competition. It comes from the Latin word, “rivalis,” or one who uses the same stream.

The paradox of water is that it is a life preserver, but it can also be a life destroyer when it becomes a carrier of deadly bacteria or takes the form of tsunamis, flash floods, storms and hurricanes. Many of the greatest natural disasters of our time have been water-related. One recent example is the Fukushima disaster in Japan, which triggered a triple nuclear meltdown.

If climate change causes oceans to rise and the intensity and frequency of storms and other extreme weather events to increase, potable water would come under increasing strain.

Rapid economic and demographic expansion has already turned potable water into a major issue across large parts of the world. It is against this background that water wars in a political and

economic sense are already being waged between competing states in several regions, including by building dams on international rivers or, if the country is located downstream, by resorting to coercive diplomacy to prevent such construction. U.S. intelligence has warned that such water conflicts could turn into real wars.

According to a report reflecting the joint judgment of U.S. intelligence agencies, the use of water as a weapon of war or a tool of terrorism could become more likely in the next decade in some regions. The InterAction Council, comprising more than 30 former heads of state or government, meanwhile, has called for urgent action, saying some countries battling severe water shortages risk failure. The State Department, for its part, has upgraded water to "a central U.S. foreign-policy concern."

Water stress is imposing mounting socioeconomic costs. For example, commercial or state decisions in many countries on where to set up new manufacturing or energy plants are increasingly being constrained by inadequate local water availability.

The World Bank has estimated the economic cost of China's water problems at 2.3 percent of its gross domestic product. China, however, is not as yet under water stress — a term internationally defined as the availability of less than 1,700 cubic meters of water per person per year. The already water-stressed economies, stretching from South Korea and India to Egypt and Morocco, are paying a higher price for their water problems.

Water is a renewable but finite resource. Nature's fixed water-replenishment capacity limits the world's renewable freshwater resources to nearly 43,000 billion cubic meters per year. But the human population has almost doubled since 1970 alone, while the global economy has grown even faster.

Consumption growth has become the single biggest driver of water stress. Rising incomes, for example, have promoted changing diets, especially a greater intake of meat, whose production is notoriously water-intensive. For example, it's about 10 times more water-intensive to produce beef than cereals.

In this light, water is becoming the world's next major security and economic challenge.

Although no modern war has been fought simply over water, this resource has been an underlying factor in several armed conflicts. With the era of cheap, bountiful water having been replaced by increasing supply and quality constraints, the risks of overt water wars are now increasing.

Averting water wars demands rules-based cooperation, water sharing and dispute-settlement mechanisms. However, there is still no international water law in force, and most of the regional water agreements are toothless, lacking monitoring and enforcement rules and provisions formally dividing water among users. Worse still, unilateralist appropriation of shared resources is endemic in the parched world, especially where despots rule.

The international community thus confronts a problem more pressing than peak oil, economic slowdown and other oft-cited challenges. Addressing this core problem indeed holds the key to dealing with other challenges because of water's nexuses with energy shortages, stresses on food supply, population pressures, pollution, environmental degradation, global epidemics, climate change and natural disasters.

"CHELLANEY: The coming water wars", 08/10/2013, online at: http://www.washingtontimes.com/news/2013/oct/8/the-coming-water-wars/?utm_source=RSS_Feed&utm_medium=RSS

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### ❖ Water scarcity is a looming threat to global security

In a water-stressed world, shared water resources are becoming an instrument of power, fostering competition between nations.

Potentially calamitous water shortages in the densely populated parts of Asia, the Middle East and North Africa could create large numbers of "water refugees" and overwhelm some states' institutional capacity to contain the effects. The struggle for water is already escalating political tensions in certain parts of the world.

Downstream Egypt, for example, uses the bulk of the Nile River's water, yet it is now threatening unspecified reprisals against Ethiopia's continuing construction of the Grand Renaissance Dam.

China, already the world's most-dammed nation, has approved the construction of 54 new dams – many of them on rivers that are the lifeblood of neighbouring countries. Turkey is accelerating an ambitious dam-building programme, which threatens to diminish cross-border flows into Syria and Iraq.
Meanwhile, intrastate water-sharing disputes have become common. Water conflicts within culturally diverse nations, such as Afghanistan, Pakistan, Yemen and Sudan, often assume ethnic dimensions, thereby accentuating internal-security challenges.

But as illustrated by the disputes within, for example, the United States, Spain and Australia, intra-country water conflict is not restricted to the developing world.

Water conflicts in America have spread from the arid west to the east. Violent water struggles, however, occur mostly in developing nations, with resource scarcity often promoting environmental degradation and perpetuating poverty. Adequate access to natural resources, historically, has been a key factor in peace and war.

Countries can import fossil fuels, mineral ores and resources originating in the biosphere, such as fish and timber. But they cannot import water, or at least not in a major or sustainable manner. Water is essentially local and very expensive to ship.

Potable water supplies will come under strain if oceans rise. Rapid economic and demographic expansion has already turned potable water into a major issue across large parts of the world. Lifestyle changes have increased per capita water consumption.

It is against this background that water wars (in a political and economic sense) are already being waged between competing states, including by building dams on international rivers or by resorting to coercive diplomacy to prevent such construction.

US intelligence has warned that such water disputes could turn violent.

According to a report reflecting the joint judgement of US intelligence agencies, the use of water as a weapon of war or a tool of terrorism could become more likely in the next decade in some regions.

The InterAction Council, comprising more than 30 former heads of state or government, meanwhile, has called for urgent action, saying some countries battling severe water shortages risk failing. Water stress is adding to socioeconomic costs.

The World Bank has estimated the economic cost of China's water problems at 2.3 per cent of its GDP. China, however, is not as yet under water stress – a term internationally defined as the availability of less than 1,700 cubic metres of water per person per year. By contrast, the already water-stressed economies, stretching from South Korea and India to Egypt and Morocco, are paying a higher price for their problems.

Nature's fixed water-replenishment capacity limits the world's freshwater resources to nearly 43 trillion cubic metres per year. But the human population has almost doubled since 1970.

Growth in consumption has become the single biggest driver of water stress. Rising incomes, for example, have promoted changing diets, especially a greater intake of meat, the production of which is notoriously water-intensive. It is about 10 times more water-intensive to produce meat than plant-based calories and proteins.

As a result, water could become the world's next major security and economic challenge.

Consider some sobering facts: bottled water at the supermarket is already more expensive than crude oil on the spot market. More people today own or use a mobile phone than have access to water-sanitation services. Unclean water is the greatest killer on the globe, yet a fifth of humankind still lacks easy access to potable water. More than half of the global population currently lives under water stress – a figure projected to increase dramatically during the next decade.

Although no modern war has been fought just over water, this resource has been an underlying factor in several armed conflicts.

With the era of cheap, bountiful water now gone, to be replaced by increasing constraints on supply and quality, the risks of overt water wars are increasing.

Avoiding conflict over water demands international cooperation. But there is still no international water law in force, and most regional water agreements are toothless, lacking monitoring and enforcement rules and provisions formally dividing water among users. Worse still, unilateralism is endemic in the parched world.

The international community thus confronts a problem more pressing than peak oil, economic slowdown and other oft-cited challenges.

Addressing this core problem holds the key to dealing with other challenges because of the nexus of water with global warming, energy shortages, stresses on food supply, population pressures, pollution, environmental degradation, global epidemics and natural disasters.

"Water scarcity is a looming threat to global security", 09/10/2013, online at:
http://www.thenational.ae/thenationalconversation/comment/water-scarcity-is-a-looming-threat-to-global-security

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### ❖ Middle East Water Initiative Based on Rhine River Model

Switzerland, Germany, France, Luxembourg, the Netherlands, Austria, Liechtenstein, Belgium and Italy are nine European countries that closely and productively cooperate to protect the Rhine River from pollution, and monitor the quality and the density of its water flow to ensure its optimal utilization. The river covers an area of 200,000 square kilometers (124,274 square miles) and reaches 20 million people. This cooperation is carried out by several bodies, notably the International Commission for the Protection of the Rhine (ICPR), which was founded in 1953 by Switzerland, Germany, France, Luxembourg and the Netherlands. The ICPR also coordinates with the European Commission and operates according to the Convention on the Protection of the Rhine, which was signed by the member states on April 12, 1999.

These European countries constitute a model for peaceful and civilized cooperation, despite their ethnic diversity and linguistic differences as well as a long history of political disputes. This is the message that the Strategic Foresight Group's (FSG) "Blue Peace in the Middle East" initiative seeks to convey to the countries of the Middle East. FSG therefore organized a trip to the Rhine between Germany and Switzerland, in which politicians, experts and reporters from Turkey, Iraq, Lebanon, Jordan, Syria, Egypt and Saudi Arabia — including an *Al-Monitor* reporter — took part.

This visit took place Sept. 24-27, and was hosted by the Swiss Agency for Development and Cooperation (SDC) and the Swiss Federal Department of Foreign Affairs. The trip included visits to water-monitoring facilities along the Rhine in Germany and Switzerland as well as meetings with Swiss and German officials. The latter explained the operation mechanism of local and international committees for the protection of the Rhine — from upstream in Switzerland down to the estuary in the North Sea — to the visiting delegation, which brought together about 35 participants.

There is no doubt that this European experience in water and environmental cooperation is a great example to be followed in the Middle East and other regions. The interventions of European officials and experts impressed the participants, who expressed their desire and aspiration to repeat the same experience at home by establishing a regional council for water in the Middle East and promote cooperation among riparian states of the regional rivers — namely the Tigris and Euphrates rivers.

Cooperation ought to start from sharing information on the quantities of water flowing down, controlling water pollution, the flow rate, the prospects of floods and fair distribution of water.

Although the European experience has proven to be a success, it would be difficult to implement the same scenario in the Middle East, as the region is riddled with obstacles. Most important, one ought to mention the political conflicts between countries in the region, which render the talk about water cooperation impossible and a mere scientific luxury, especially in light of the political, military and sectarian conflicts plaguing the region — in Syria and Iraq and their extensions to Turkey, Lebanon and Jordan. This is not to mention the Israeli-Palestinian conflict, which makes the talk about water cooperation with Israel and the Arab states pointless, given the Israeli occupation of Palestinian, Syrian and Lebanese territories and the persistent issue of the Palestinian case and refugees.

The launchers of the Blue Peace initiative, in which many former ministers from the countries of the region participated — including former Turkish Foreign Minister Yasar Yakis, former Lebanese Finance Minister Mohammed Shateh and the former Iraqi human rights minister Bakhtiar Amin— believe that water cooperation between the region's countries may be a factor that could trigger peace in the region. The premise of the initiative is that "two countries that are bound by an effective water cooperation [agreement] are not likely to slide into war for no apparent reason."

This approach needs to be closely examined whether at the global or the regional level, to ensure its feasibility and viability. Normally, political consensus and peace precede water, economic, scientific and cultural cooperation between two countries.

Indeed, the European cooperation — whether at the European Union or regarding the Rhine — took off after the end of wars between European countries in the early 1950s. This cooperation culminated in the signing of the Maastricht Treaty for the establishment of the EU in February 1992 and the Convention on the Protection of the Rhine in 1999.

During her intervention at the ICPR headquarters in the German city of Koblenz, Anne Schulte-Wulwer-Leidig — ICPR deputy secretary-general — stressed that political consensus constitutes a prelude to water and environmental cooperation. She mentioned the Sandoz chemical spill, which

was caused by a fire in the insecticide warehouse of Sandoz Ltd. near the city of Basel in Switzerland on Nov. 1, 1986. The subsequent extinguishing of the fire caused chemicals to enter into the Rhine. It turned out later the stored chemicals that entered the river included disulfoton, a toxic substance that caused the death of thousands of fish.

This incident caused the ministers of the Rhine countries to meet on Nov. 12, 1986. This is when the Rhine Action Program was adopted and necessary measures were taken to protect the river from pollution, and to establish stations to monitor the river's waters. The Swiss and the German sides agreed to establish a joint monitoring station in Basel.

This disaster urged many political, scientific and technical parties to employ concerted efforts to decontaminate the river and revive its animal life. Today, the Rhine is free from any contamination. Its animal life has been restored, namely the precious salmon. The Rhine has also become safe for swimming and drinking.

This is unlike the case of many rivers in the Middle East, which are highly polluted — the Tigris and Euphrates rivers and the Jordan, Yarmouk and Litani rivers, among others.

The visit began with a meeting with SDC officials at the headquarters of the Finance Ministry in Bern, where the Blue Peace initiative and the European experience of the Rhine were discussed. Moreover, the delegation's members of parliament (MP) and politicians met with Swiss MPs and officials.

*Al-Monitor* learned that the Swiss side inquired about the nonparticipation of the Israeli side in the initiative. The Lebanese side said that it rejected the participation of Israel due to the state of war between the two countries and the boycott of Lebanon and Syria against Israel, stressing that water-problem talks come after resolving the Palestinian issue, including the issues involving the occupied territories and Palestinian refugees.

The field trip started the next day with a visit to the Swiss water-monitoring station, followed by a visit to the joint German-Swiss station in Basel. The delegates were briefed on how the station's

workers take samples of the Rhine water several times a day to determine the amount of harmful and toxic chemicals and report back to the ICPR.

The third day, the participants visited ICPR headquarters in Koblenz. A number of officials in the commission and the German Federal Institute of Hydrology discussed the working mechanisms, achievements and prospective projects of the commission. German officials and researchers — in addition to participants — asked about ways to convey the European experience to the Middle East, and convince some countries of the region to cooperate and share the water instead of monopolizing it under the pretext of being an upstream country with a sovereign right to invest in water. Participants agreed on activating the media committee and developing a website to promote the initiative and the issue of water in the Middle East, in addition to producing a documentary film.
Therefore, Switzerland — a neutral European country — is trying through the funding of the Blue Peace initiative and extending the funding for two additional years to find a common ground for participants and encourage them to cooperate regarding the issue of water. The head of Indian SFG, Sandeep Waslekar, insists on finding a Turkish-Iraqi rapprochement after the elections scheduled in 2014 in both countries, to promote water cooperation and establish a regional council for water cooperation or a joint Iraqi-Turkish committee.

The visit to the Rhine comes as a complement to the Blue Peace in the Middle East initiative that was held in Istanbul in March 2013. A meeting in the Jordanian capital will follow in November, where SFG's report titled "Water Cooperation for a Safe World: Emphasis on the Middle East" will be presented.

It is important to note that the Rhine is one of the most important European rivers with a length of about 1,232 kilometers (765 miles). It is linked to other important rivers such as the Danube and the Rhone, rendering it a significant internal navigational passage through which Dutch and German ships transport coal, oil products, ore and grains. This river played an important role in delineating borders. In addition, Romans built colonies on this river in Cologne in 38 B.C. It was also a subject of dispute between European countries, notably France and Germany.

"Middle East Water Initiative Based on Rhine River Model", 11/10/2013, online at: http://www.al-monitor.com/pulse/originals/2013/10/blue-peace-initiative-rhine-middle-east-water-agreement.html

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### ❖ New call for action as the Middle East faces increased pressure on limited water resources

*The Arab Water Council is confirmed to address the issue of water security in arid regions at the International Water Summit, 20-22 January 2014 in Abu Dhabi*

One of the Gulf region's most influential water authorities, the Arab Water Council, has urged governments to keep water at the top of the political agenda.
Dr Mahmoud Abu-Zeid, President of the Arab Water Council, said that with the Middle East being one of the driest zones in the world, the issue of water must be taken seriously to help meet the challenges of water security.

"Governments need to address the priority needs to ensure there is sufficient water for their populations. They can start by preparing water plans for the short, medium and long term. They can also assess the available fresh water resources and develop them, and consider the non-conventional water resources including wastewater, salt water, wadi water and non-renewable groundwater," said Dr Abu-Zeid.

"New call for action as the Middle East faces increased pressure on limited water resources", 08/10/2013, online at: http://www.zawya.com/story/New_call_for_action_as_the_Middle_East_faces_increased_pressure_on_limited_water_resources-ZAWYA20131008115814/

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### ❖ GCC urged to conserve water resources

Governments in the Gulf region have been urged to keep water at the top of the political agenda by a regional water authority.

Dr Mahmoud Abu-Zeid, president of the Arab Water Council, said that with the Middle East being one of the driest zones in the world, the issue of water must be taken seriously to help meet the challenges of water security.

"Governments need to address the priority needs to ensure there is sufficient water for their populations. They can start by preparing water plans for the short, medium and long term. They can also assess the available fresh water resources and develop them, and consider the non-conventional water resources including wastewater, salt water, wadi water and non-renewable groundwater," said Dr Abu-Zeid.

He also urged the application of Integrated Water Resources Management (IWRM) concept to ensure water sustainability.

"IWRM takes a coordinated approach to the development and management of water, land and associated sources and it has now been accepted internationally as the sustainable way forward. This concept involves liaising with the different stakeholders in planning, implementing and managing water resources," said Dr Abu-Zeid.

Dr Abu-Zeid is one of the many regional and international water experts who will present at the International Water Summit to be held from January 20 to 22 next year, at the Abu Dhabi National Exhibition Centre as part of Abu Dhabi Sustainability Week.

The event will also have other water solutions experts address key topics including intergrated water resource management, water governance and strategy, water security and future water sustainability.

Ara Fernezian, managing director, Middle East for Reed Exhibitions, said: "The IWS 2014 exhibition

will offer unlimited business opportunities to network and share case studies, best-practice and new technologies for long-term water solutions."

IWS 2014 is a global platform that hosts world leaders, government organisations, policymakers, public and private sector investors, business leaders, consultants and water experts to interact, negotiate and finalise plans to develop diverse and sustainable water portfolios in the GCC and other regions.

"GCC urged to conserve water resources", 09/10/2013, online at: http://www.tradearabia.com/news/OGN_244316.html

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### ❖ Restore the Jordan River: Mideast environmentalists seek support in Chicago

Critical concerns about restoring water levels and sanitizing the Jordan River in the Middle East came to Chicago Tuesday.

The Israeli, Jordanian and Palestinian leaders of Friends of the Earth Middle East spoke about the drought-ridden river at the University of Illinois at Chicago Tuesday, hoping to garner financial support in Chicago.

One of the leaders attributed a part of the problem to climate change, with responsibility, he said, falling heavily on the West.

If the Jordan River were restored to its natural flow, without diversions for agricultural, municipal or industrial uses, 45.9 billion cubic feet would flow down the river to the Dead Sea. Overuse has reduced the river to 3 percent of its historical flow, leaving parts of the southern end of the river completely dry.

Gidon Bromberg, the Israeli director of Friends of the Earth Middle East, compared the Jordan to a river closer to home.

"We'd like to see the River Jordan flow one day as the Chicago River flows today," said Bromberg.

He identified diversions as the immediate source of low water levels, but pointed to the long regional dryness that climate change would mean for the Middle East, calling attention to the need for global support in mitigating the issue.

"That is your problem. I mean it's the United States, it's China, it's Europe that is largely responsible for climate change globally or in the marginal parts of the world that we live in," said Bromberg.

Globally, scientists are researching the long term effects of climate change on water resources, especially in the Middle East where the rain season only lasts from September through April.

"It's a hot spot in the sense that it's already a water scarce region," said Dr. Rana Samuels, a climate scientists at Tel Aviv University.

Samuels' research has coupled climate models and hydrological models to find that the combination of decreased rainfall and increased variability in rainfall will have what she called a "double whammy effect" on the water cycle.

"If there is going to be a 10 percent reduction in rainfall, then the loss of water is higher than 10 percent," she said.

She explained that for countries with largely clay-based soil at the southern end of the Jordan River, decreased rainfall and increased variability could mean longer gaps in rainfall. Longer periods without rain would produce impenetrable soil and encourage runoff.

Samuels said that Israel is very aware of depleting water resources and that large desalination efforts of water from the Mediterranean Sea have been implemented to tackle this issue.

Desalination has helped Israel garner a surplus of water, but this has spurred controversy in surrounding nations, especially in Palestine, which experiences water shortages from the Jordan River and does not benefit from Israel's desalination efforts. Friends of the Earth Middle East is involved in bringing Israeli, Jordanian and Palestinian leaders together to restore and sanitize the Jordan River, blurring the divide and getting past the politics.

"Water doesn't recognize borders," said Elif Kalan a fellow at UIC's Institute for Policy and Civic Engagement who is from Turkey and spent some time studying water management in Jordan through the European Union's Salto Youth Program."Those resources must be based on the needs of humans rather than political reasons," she said.

"Restore the Jordan River: Mideast environmentalists seek support in Chicago", 09/10/2013, online at: http://news.medill.northwestern.edu/chicago/news.aspx?id=224634

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### ❖ Scholar on Mideast woes: It's oil and water

Oil pipelines built under the Middle East by competing European oil companies a century ago shaped borders, fueled nationalistic tendencies, and affected regional military strategy in modern times.

These vestiges of colonialism also are leaving their mark on the flow of water in a region in which the Jordan River is depleted and polluted, and potable water has become a valuable commodity for both Muslims and Jews.

"The Middle East territorial system was largely put in place by the colonialists," said Rachel Havrelock, associate professor of English and Jewish studies at the University of Illinois at Chicago.

Speaking Oct. 1 at the annual Ruth and Alvin Rockoff lecture of Rutgers University's Allen and Joan Bildner Center for the Study of Jewish Life, Havrelock said that new regional approaches to water conservation could transform the legacy of these conflicts.

The program, cosponsored by Rutgers' Center for Middle Eastern Studies, drew a large crowd to the student center on the university's New Brunswick campus.

Havrelock, author of *River Jordan: The Mythology of a Dividing Line*, is currently working on a book about the history of a BP oil pipeline that ran from Kirkuk, Iraq, to the port of Haifa from 1935 to '48.

What she assumed was a blip in the tumultuous history of the region turned out to have far-reaching consequences into the next century. Oil executives and colonial rulers carved up territory and helped sow seeds of discontent between the nascent Arab and Zionist nationalist movements.

"None of the citizens had any rights to anything beneath the ground," said Havrelock, referring to plans by both French and British interests. "They had no rights to anything subterranean, and that was where all the money was."

The often arbitrary divisions of territory and spheres of influence were later codified in the Sykes-Picot Agreement of 1919, partitioning the Ottoman Empire among the European allied powers.

Because of widespread unrest and sabotage, surveillance stations were installed to house employees and arms. Today, these same installations continue to be military installations in their respective Arab countries and Israel.

"Saddam Hussein launched SCUD missiles into Israel to Haifa along the same aerial route of the pipeline," during the first Gulf War, said Havrelock.

Today, as part of the 1994 peace agreement between Israel and Jordan, the two countries send each other purified water. More significantly, 17 Palestinian, Israeli, and Jordanian communities have joined in the Good Neighbors Water Project to address a lack of sewage treatment facilities, pollution in the once mighty Jordan River, and sharing clean water resources.

"Many communities in the West Bank realize it is a regional issue," said Havrelock.

She pointed out that untreated water "knows no ethnic boundaries" and its presence has resulted in a growing realization that collaboration is the only solution.

Toby Jones, associate professor of Middle East history at Rutgers, who spoke after Havrelock, praised her work on oil politics in the Middle East and the "hopeful politics" over cooperation of water resources.

While the legacy of oil "haunts" the region and relations between Arabs, Israelis, and Palestinians, water holds the promise to bring them together.

"We can live without oil," said Jones. "We cannot live without water."

"Scholar on Mideast woes: It's oil and water", 08/10/2013, online at:
http://www.njjewishnews.com/article/18592/scholar-on-mideast-woes-its-oil-and-water#.UlZVY9K8ka4

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### ❖ Focus on reducing urban water leakage

No resource is more fundamental to life and human society than water. Yet, globally, 25 to 30 percent of drinking water is lost every year due to leakages in urban water distribution systems.

The EU-funded project LEAKCURE ('Intervention for curing pipeline leakage in urban water mains') is proposing an innovative solution for the automatic detection, sealing and curing of typical network pipes, without digging up pavements and roads.

"The majority of network water leaks are not easily detectable by conventional means," says project coordinator Peter Paz of Israel's Curapipe System Ltd. "Traditional find-and-fix methods are inefficient, while eliminating several leaks all at once by replacing entire mains is expensive and disruptive."

Water stress, reflecting the balance between water supply and demand, is now showing up in areas where it was not generally seen before, such as in the UK, says Paz. At the same time, water stress is worsening in other areas, including parts of Southern Europe. This is partly due to climate change and partly due to other factors, such as increased urbanisation and industrialisation.

"In the past," he says, "pipeline leakage was not always considered a priority. Now, with water stress on the rise and a lack of readily available new water supplies, leakage levels in Europe and worldwide have started to draw more attention."

The LEAKCURE solution, dubbed 'Trenchless, Automated Leakage Repair' (TALR), involves launching special devices known as 'pigs', linked together in a 'pig train'.

A pig is essentially a plug-like device that can be made to move through a pipe, controlled via pressure and flow. Two pigs linked together can block the water in front and behind, while leaving a void in between. In the LEAKCURE pig-train, that void is filled with a special viscous curing substance, which travels down the pipe between the pigs.

"The train moves in a continuous fashion, never stationary," Paz says, "sealing leaks automatically as the curing substance comes into contact with a leak at any orientation within the pipe. The substance hardens and the leak is permanently cured as the train continues along the pipe."

Paz says current repair practices have tended to focus on damage control - keeping leakage from increasing rather than actually reducing it. "Our solution is geared to reducing current unacceptable levels of leakage by a significant amount, which in Europe means close to a third of the supplied water."

The LEAKCURE project is testing its new system in the UK, setting up local partnerships and field trials. Following the trials, and once the necessary adaptations are made to suit local contexts, the project will expand its activities beyond the UK.

Paz says Curapipe will market the TALR service to water utilities in partnership with local partners already active in water pipeline repair and maintenance.

"So far," he says, "our results indicate that we can repair the kinds of leaks that are responsible for most of the water loss. We are talking about leakages ranging from 40 to 3000 litres per hour. Extending that, if we can treat 40 kilometres of leaky pipeline, we could potentially save 1.7 million litres of pure drinking water every day."

According to the UK's Water Services Regulation Authority (OFWAT), the benefits of water leakage reduction will be significant, including more usable water left in the environment for other users, such as farmers, or to sustain natural habitats. Businesses and municipalities will spend less on new water supplies, saving on treatment and pumping costs, and, by rendering these operations more efficient, they will be able to reduce their energy expenditure and greenhouse-gas emissions.

"Focus on reducing urban water leakage", 07/10/2013, online at:
http://cordis.europa.eu/fetch?CALLER=EN_NEWS&ACTION=D&SESSION=&RCN=36134

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### ❖ Water Shortage Seen Worsening on Climate Change in Potsdam Study

Water scarcity will increase around the world due to climate change, with more than 500 million people affected if mean global warming is limited to 2 degrees Celsius (3.6 degrees Fahrenheit), based on modeling studies by the Potsdam Institute for Climate Impact Research, or PIK.

An additional 8 percent of humankind may face new or worse water scarcity with 2 degrees warming, the target set by international climate negotiators, the German government-fundedinstitute wrote in a news release today. That could reach 13 percent in the case of a 5-degree-Celsius rise, which is probable if climate change goes on unchecked, PIK said.

About 1.3 billion people already live in water-scarce regions, according to the institute. The institute calculated 152 scenarios using 19 climate change models, and said the projections for the affected population by 2100 carry a greater than 50 percent confidence.

"Our findings support the assertion that we are fundamentally destabilizing our natural systems," Wolfgang Lucht, one of the study co-authors, was cited as saying in the statement. "We are leaving the world as we know it."

A business-as-usual scenario modeled by the institute, with 5 degrees warming and a continued increase in the global population, would result in more than 1 billion additional people affected, PIK wrote.

Two degrees warming would cause "substantial" ecosystem changes in regions that cover 1 percent of the unique habitat of higher plant species, while at 5 degrees warming that would rise to 74 percent, according to the research. The results suggest the increasing impact of warming is nonlinear, the authors wrote.

"The findings clearly demonstrate that there is a large difference in the risk of global ecosystem change under a scenario of no climate change mitigation compared to one of ambitious mitigation," Sebastian Ostberg, one of the study authors, was cited as saying.

Regions at risk in case of unchecked global warming include the grasslands of eastern India, the forests of northern Canada, the savannas of Ethiopia and Somalia and the Amazonian rain forest, according to the institute.

"Water Shortage Seen Worsening on Climate Change in Potsdam Study", 08/10/2013, online at: http://www.bloomberg.com/news/2013-10-08/water-shortage-seen-worsening-on-climate-change-in-potsdam-study.html?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=ce0c262530-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-ce0c262530-250657169

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## ❖ Agriculture Politics in Israel and Palestine

To be a farmer in Israel or Palestine is unavoidably a political activity.

Both the policies and the practices that influence agricultural production have a strong significance in a land where, for the last centuries, there has been a continuous conflict over the natural resources of land and water. The current political situation has two contrasting outcomes: while Israel is producing 85% of its food, 38% of Palestinians (56% in the Gaza Strip) are food insecure.

According to a joint rapid food security survey in the occupied Palestinian territories, food availability is not the most critical issue presently. The main driver of Palestinian food insecurity is rather of a political nature as key elements in vulnerability are rooted in the military and administrative measures imposed by the Israeli occupation as well as Jewish settlement expansion.

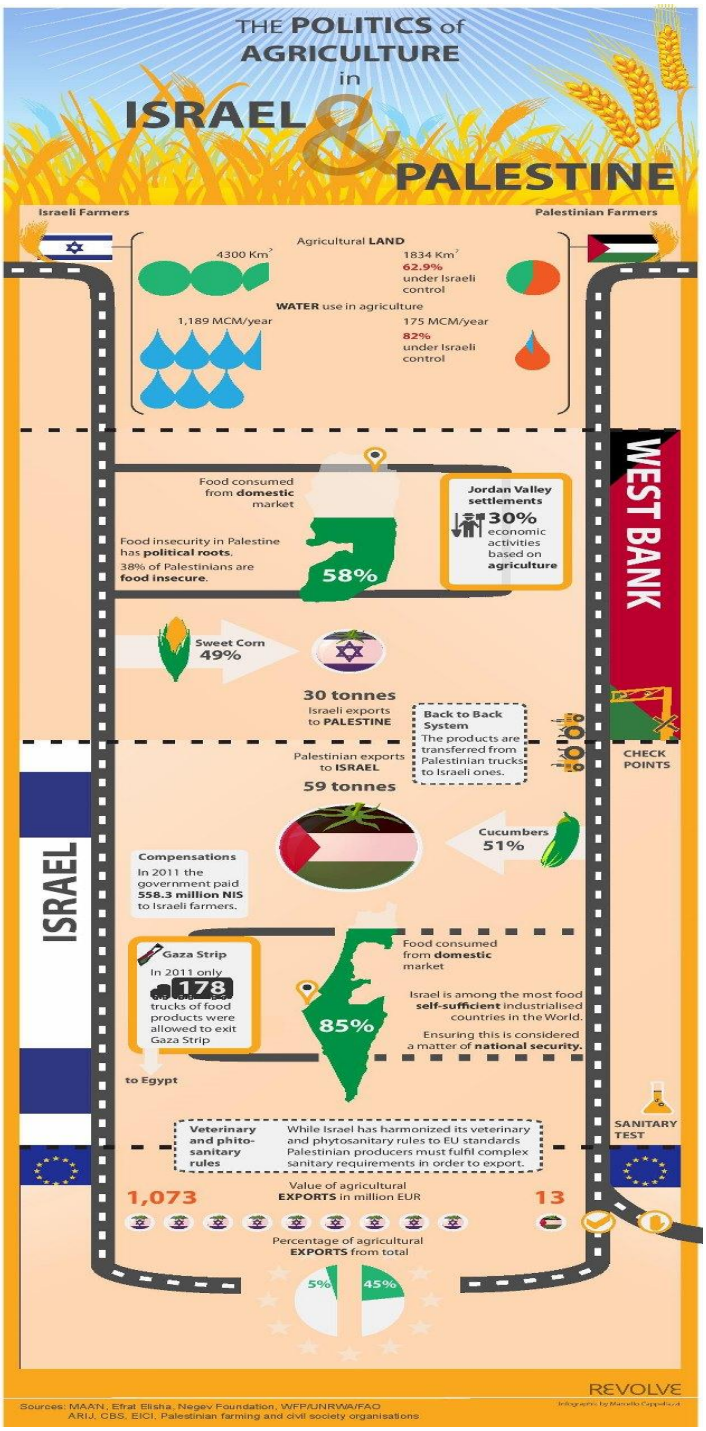
The international community has created several aid programs to address the chronicle vulnerability of the poorest communities, but little has been done in order to restore the Palestinian right to food sovereignty.

There are different marketing systems and channels available for Palestinian farmers to sell agricultural commodities, but only a few of them grant the minimum profit necessary to cover the production costs. This is due to the variation of prices both within the Palestinian domestic market and in comparison with the Israeli one. The produce selling price in Palestine is the lowest compared to wholesale through the West Bank Governatorates (178% higher) or the transaction to Israeli merchants (218% higher).
The condition of the agricultural sector in the Gaza Strip is even more extreme. The on-going international isolation and the repeated Israeli military attacks have almost completely destroyed the agricultural sector. After Israel's 2008-09 attack, 46% of the agricultural land was estimated to be inaccessible and 30-40% of it is still enclosed in the buffer zone imposed by the Israeli Army along the Palestinian side of the narrow Gaza Strip.

**Palestinian exports**

Exports for Palestinian producers to the Israeli and international markets is more profitable, but this profit comes with complex restrictions and regulations. The exports to the international markets are handled by Israeli companies when shipping products to Europe, the U.S. or Russia, while some newly established Palestinian companies regulate the exports towards Arab countries.

Europe is one of the biggest markets for Palestinian agricultural commodities that represent the 85% of total exports towards the EU. The access to this market for Palestinian traders are Israeli ports of entry and exit, where Palestinian products receive discriminatory treatment (for example the security measures) despite the Paris Protocol that affirms the principle of equal treatment for Palestinian and Israeli goods.




**Israeli producers**

The conditions for agricultural production in Israel are radically different. The Israeli market is capable of absorbing 85% of its food needs from domestic production. This is possible thanks to a number of supportive political measures. The Investment Directorate at the Israeli Ministry of

Agriculture for example gives farmers grants in accordance with a program for encouraging capital investments in agriculture. Among the beneficiaries of such programs are the Israeli settler-farmers living illegally in the West Bank.

Agricultural ventures in Israeli settlements are particularly profitable due to massive government investments and involvement in major infrastructure projects, especially in the occupied Jordan Valley. There, with the aid of large scale capital investments, it was possible to raise large crops of winter vegetable and fruits which could be sold at high prices in the European markets. It is no surprise that according to settlement authorities in the Jordan Valley "about 30% of the settlements' economy is based on agriculture and an additional 30% comprises agricultural related services."

Loss of sources of income and high unemployment leave many Palestinians with no option but to work for Israeli agricultural companies in illegal settlements. Palestinian workers earn on average less than half of the minimum wage stipulated by Israeli law.

**Israeli exports**

The investments in the agricultural sector are backed by strong commercial ties between Israel and its major European markets where 66% of total Israeli exports are absorbed. More than 25% of Israel's agricultural products and more than 75% of its total fresh products are exported to European countries. The European Neighborhood Policy and the Action Plan adopted in 2004 underpinned the process of integration of the Israeli market into the European one by substantially removing trade barriers for agricultural products. The approximation to EU veterinary and phytosanitary rules further facilitates access for Israeli goods to the European market.

Considering that, for example, 40% of the dates exported by Israel were produced in the Jordan Valley settlements the political relevance of agricultural production and trade in Israel and Palestine is evident. Policies and practices have in fact exacerbated the consequences of the Israeli occupation and settlement enterprise. The competition for Palestinian farmers is economically unfair for the preferential trading systems from which Israeli producers can benefit, and because part of these products are grown on Palestinian soil and with Palestinian water, and in many cases by Palestinian hands.

Agriculture Politics in Israel and Palestine, Revolve, 10/10/2013, online at: http://www.revolve-magazine.com/home/2013/10/10/agriculture-politics-in-israel-and-palestine/

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### ❖ Project to replenish Dead Sea water levels confirmed

The government in Jordan has finally given the go-ahead for one of the Middle East's biggest projects, a pipeline taking water from the Red Sea to replenish the Dead Sea.

The project will also produce millions of litres of fresh water for both Jordan and Israel, a boon to farmers trying to raise crops in the arid lands around.

But the plan is being criticised by environmentalists, who say it could ruin the unique water of the Dead Sea.

Jeremy Howell reports from just south of the Dead Sea in Jordan.

"Project to replenish Dead Sea water levels confirmed", 11/10/2013, online at: http://www.bbc.co.uk/news/business-24501840

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### ❖ Resurrecting the Dead Sea

In the 1960s, coinciding with population increases, great amounts of water from the water system we know as the Jordan River began to be drained off for irrigation and overall water needs. The Jordan River is also the main feed for the Dead Sea. With reduced water volumes, the Dead Sea levels are lowering at an increasing rate. Without a continual supply of water, the Dead Sea began exhibiting extraordinary and detrimental ramifications. To perceive the cause and effect, one must understand the geological process that distinguishes this body of water, unequaled by any other body of water in the world.

The seawaters are mineral rich that became an extraordinary popular resort of sorts for sovereigns and provincials alike becoming soothed by the sea's invigorating waters throughout history as a natural spa. It has also been a source for people worldwide that purchase Dead Sea salts.

Alike to a domino effect, because the continual siphoning of the Jordon River, the river loses volume. This results in the Jordon not being able to be a continual source of water for the Dead Sea and so because of the high demand for the water the Dead Sea lowers. Like any body of water, if it lowers, water tables are affected by degenerating and because of this, the populace around the Sea loses or becomes limited to water usage. When the water tables lower wells begin drying up and likewise the local more diminutive lakes and streams follow suit. To add salt to the wound, so to speak, hydroelectric dams begin loosing potency in supplying energy to the populace. It is estimated that the world's saltiest body of water will dry out by 2050.

It is understandable why the situation of the Dead Sea is catastrophic in nature. The population is increasing and water will be even more of a demand and it is highly doubtful that this part of the equation will change and the water consumption will continue but also increase. The water ministry estimates Jordan, whereas 92 % of the country is desert, will require 1.6 billion cubic meters of water a year to satisfy its needs by 2015. That is taking into consideration that the population of 6.8 million is raising by approximately 3.5 percent per year.

When humankind unite and form bonds of cooperation anything can be done. In 2005 Jordon, Palestinian Authority, and Israel agreed to combine efforts by signed agreement to study the leading question for a solution. Obviously, the resolution involved acquiring more water to counterbalance the insufficiency of the Jordon River. The agreed solution was to pipe in waters from the Red Sea and

the Mediterranean to replenish the Dead Sea, a monumental undertaking for humanity. Not only would this project fulfill water requirements but open opportunity to expand hydroelectric power increasing the magnitude of national power grids.

As with any monolithic expanse of this nature, there is a concern for environmental transmutations upsetting the natural balance of the areas affected. Because of the high salination of the Dead Sea, there is a concern that this project could affect the natural balance by diluting the waters. You may conceptualize that this would be beneficial but you need to take into consideration the micro-evolutionary ramifications of a natural system. The Dead Sea and everything living within and the influences of the sea to the surrounding coastlands depend upon and has evolved dependency upon the present chemistry of the waters. In summation, the over-saturation of seawater could countermine the Dead Sea's delicate ecosystem.

The Red Sea to Dead Sea channel would travel through Jordan costing around $10 billion, imparting up to 2 billion cubic meters of water a year according to reports. This type of project is nothing new for undertakings of this scope have been built in the United States, South Africa and Brazil. As of the writing of this report, the government has sanctioned the project after arduous years of geological, political, technical, and economic studies and that the $980 million program is projected to furnish Jordan with 3.5 billion cubic feet of water on a yearly basis.

It is evident that this project is a necessity to all areas affected and with provident provisions not only brings the much-needed water to the region but possibly bring about peaceful coexistence between countries by means of collaboration.

"Resurrecting the Dead Sea", 12/10/2013, online at: http://www.projectaccelerator.co.uk/resurrecting-the-dead-sea/3646

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### ❖ Montenegro becomes 31st state to join UN Watercourses Convention

On Dec. 8, 1970, the UN General Assembly adopted a resolution recommending that the International Law Commission (ILC) commence a study of non-navigational uses of international watercourses."

Preparing draft articles from 1991-1994, the ILC adopted the expression "international watercourses," which included surface waters, tributaries and groundwater that are hydrologically connected with surface water.

The United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, which the ILC had been working on since 1970, was adopted by 103 votes in favor to three against (Turkey, China and Burundi) with 27 abstentions by the UN General Assembly on May 21, 1997. However, it has not entered into force as it has not yet been ratified by all 35 states. It took 27 years to prepare the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses. The difficulties regarding hydrological inconsistencies and legal adjustments are mentioned within the framework of the convention. Significant principles, collaboration and joint management responsibilities, required for cooperation, are also noted.

The convention serves as a guide for states about conflicts over future supplies. Also, the convention seeks to institutionalize relations between upstream and downstream riparian states through the principle of "equitable and reasonable utilization" in Article 5 and the principle of "prevention of significant harm" in Article 7 of the convention. Within the framework of equitable and reasonable utilization, riparian states are to participate in the use, development and protection of an international watercourse in an equitable and reasonable manner.

In Article 6 of the convention, utilization of an international watercourse in an equitable and reasonable manner requires taking into account seven relevant factors and circumstances, which are as follows: geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character; the social and economic needs of the watercourse states concerned; the population dependent on the watercourse in each watercourse state; the effects of the use or uses of the watercourses in one watercourse state on other watercourse states; existing and potential uses of the watercourse; conservation, protection, development and economy of use of the water resources of the

watercourse and the costs of measures taken to that effect; and the availability of alternatives, of comparable value, to a particular planned or existing use.

Watercourse states shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent causing significant harm to other watercourse states. Where significant harm is caused to another watercourse state, the states whose use causes such harm shall, in the absence of an agreement for such use, take all appropriate measures with due regard for the provisions of Articles 5 and 6, in consultation with the affected state, to eliminate or mitigate such harm and, where appropriate, to discuss the question of compensation.

As mentioned above, Turkey voted against and thus is not a party to the convention. Turkey did not sign the convention because of Article 5 -- equitable and reasonable utilization, Article 7 -- obligation not to cause significant harm, Articles 16-23 -- obligation to provide notification and Article 33 -- settlement of disputes.

It is observed that there has been a rapid increase in the number of countries having approved the convention recently, which requires ratification by 35 countries for its entry into force. Following Niger's acceptance of the convention in February 2013, Montenegro became the 31st party to the UN Watercourses Convention on Sept. 24, 2013. In the coming period, Gambia, Ivory Coast, Senegal, the United Kingdom and Ireland are expected to ratify the convention.

The 1997 UN convention, aiming to protect and preserve international watercourses and develop international law and which is expected to enter into force through the ratification and accession of 35 countries, would not create a problem for Turkey in terms of legal sanctions since it is not a party to the convention. While Iraq, our riparian neighbor of the Euphrates and Tigris basin, became a party to the convention, Syria made reservations about the ratification regarding Israel. Frequently criticizing upstream riparian Turkey's water policies, Iraq will continue to criticize on the basis of the convention after its entry into force.

"Montenegro becomes 31st state to join UN Watercourses Convention", 13/10/2013, online at: http://www.todayszaman.com/news-328756-montenegro-becomes-31st-state-to-join-un-watercourses-convention.html

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### ❖ Uganda: Museveni Flags-Off Construction of Isimba Power Dam

President Yoweri Museveni has laid the foundation stone of the proposed 183 megawatts (MW) Isimba Hydropower Project along the River Nile.

This signifies the commencement of work for the $556m dam. The contractor, China International Water and Electric Corporation, pledged to complete the project in 40 month.

The president, while addressing a rally at the nearby Kikandwa Church of Uganda Primary School, outlined five channels of getting the community out of poverty.

"You need to feed yourself but also earn income. Modern and commercial agriculture is the sure way and it is easy. Subsistence farming won't get you (households) out of poverty," he said.

The second path of getting out poverty, according to the president, is industrialization, which not only create jobs but also provide necessities for better living conditions.

"Every day I am opening new factories. Industries are important to the country as well as households," Museveni said.

The president mentioned service provision, technology and internet and public service jobs as other channels of creating jobs and reducing household poverty.

"You need electricity. If there is no power you cannot progress. We need good roads, communication and electricity to develop," he said.

"This (Isimba) project will deliver electricity to run factories, small and large businesses. People need to Kulembeka (tapping opportunities) to improve their lives and get out of poverty."

The minister of energy and mineral development, Eng Irene Muloni, explained that the dam straddles across the river.

"The dam will support a bridge which will open up both Kamuli and Kayunga districts to the rest of the country across the River Nile," she said.

"During construction, both districts will provide labour and construction materials for the project. In addition, the local communities in both districts will be supplied with electricity," she said.

As provided for by the law, the minister said, both districts will receive royalties from the production of electricity estimated at sh212m every year.

China's EXIM Bank provided concessionary (soft) loans to finance not only Isimba hydropower project but also the proposed 600 MW Karuma Hydropower project.

"Uganda: Museveni Flags-Off Construction of Isimba Power Dam", 06/10/2013, online at: http://allafrica.com/stories/201310070109.html

### ❖ China's Soft Path to Transboundary Water

China is upstream of most of its 40 major international transboundary waters, it shares with 14 neighbouring countries. This hydro-geographically advantaged situation not only offers China great advantages, but also important duties. With China's new political leadership under President Xi Jinping, the past months have demonstrated a focused rolling out of China's foreign policy as the 'good neighbour', seeking to deepen regional partnerships that promote enhanced regional peace, security and prosperity.

The recent Shanghai Cooperation Organisation meeting (Bishkek, September 2013) provides ample evidence of China's proactive stance joining with its neighbours, to *"safeguard regional security and stability, advance regional development and prosperity, establish a more equitable international order and promote world peace and development."* President Xi has just completed bilateral visits to most of the Central Asian countries, having already paid visits to Russia, as one of China's key strategic partners.

Separately, China's new Premier Li Keqiang has remarked that China's limited water resources have become serious economic and social development constraints and suggested that water conservation and improved water-use efficiency are priorities. Premier Li has also been busy with a series of bilateral visits, including visits to India and Pakistan, seeking to deepen cooperation.

At the Boao Forum for Asia gathering on 8 April 2013, President Xi stated, *"... we should boost cooperation as an effective vehicle for enhancing common development… While pursuing its own interests, a country should accommodate the legitimate concerns of others. ... We need to work vigorously to create more cooperation opportunities, upgrade cooperation, and deliver more development dividends to our people and contribute more to global growth."*

This focused regional outreach and consistent message aligned to China's foreign policy is important. What remains to be seen is how it is played out in practice. Recent reports suggests that the world's future water/food/energy security will be determined in large part by what happens across Asia. With China now the globe's second largest economy, and growing, the increased pressure on water resources, which are essential for economic growth, must be addressed.

Transboundary water resources shared with China's many neighbours are largely unregulated by international agreements, which could cause regional tensions in neighbourly relations. While there

are a number of water-related treaties with its northern and western neighbours, Russia and Kazakhstan as two primary examples, the major transboundary waters across its southern reaches are covered only by some agreements on hydrological data exchange. This provides a basis for cooperation, but leaves the difficult issues of allocation of uses of shared transboundary freshwaters unresolved. Hence the current issues on the Yarlung Zangbo/Brahmaputra River, shared by China and India.

China's intention to build dams on its upper reaches has raised serious concerns in India and Bangladesh, both downstream on this major shared watercourse. There are similar issues related to China's dam-building on the Lancang, upstream on the Mekong, shared with Myanmar, Thailand, Laos, Cambodia and Vietnam.

International law provides clear guidance on how transboundary freshwater resources should be shared and managed. These are based upon the bedrock rule of international law, the 'duty to cooperate', espoused in the UN Charter and at the heart of international entitlements and obligations.

China's development of its transboundary waters and relations with its neighbours are covered by this rule of law.

It is hoped that the new generation of Chinese leadership which now seeks positive, mutually beneficial engagements with its neighbours, will find meaningful cooperative frameworks regarding its transboundary water resources.

The treaty practice with Russia and Kazakhstan provide platforms for technical cooperation, but there is room for improvement in the remit of the joint river basin commissions created under these treaty regimes.

The southern transboundary waters originating in the Himalayan 'water towers' need more attention in terms of agreed legal regimes. The extensive work by the UN in this area of law, demonstrated by the 1997 UN Watercourses Convention (soon to enter into force) and the 1992 UN Economic of Europe Transboundary Waters Convention (now open for universal accession) provides helpful guidance on how China might upgrade its international water agreements. This will contribute to

realising China's express foreign policy to 'energetically pursue regional cooperation' – which will be to benefit of us all.

"China's Soft Path to Transboundary Water", Patricia Wouters, 10/10/2013, online at: http://chinawaterrisk.org/resources/analysis-reviews/chinas-soft-path-to-transboundary-water/

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### ❖ Ancient rivers tell story of first migration

River systems that flowed through the Sahara made human migration from Africa possible through harsh desert conditions.

The 'green corridor' hypothesis, which explains early human migration from Africa, has been strengthened by evidence of ancient rivers that flowed north through the Sahara desert some 100,000 years ago.

Geological data suggest that a wetter climate during the period between the last two ice ages produced rainfall on the mountain ranges in the Sahara and created green corridors through which early modern humans migrated from Africa.

The obstacle of the Sahara desert to human dispersal has long raised questions about the migration of Homo sapiens who originated in sub-Saharan Africa. The green corridor theory suggests rivers would have provided fertile habitats for animals and crops allowing humans to migrate north.

Geographers from the University of Hull have produced what they say is the strongest evidence yet for the hypothesis by producing a computer simulation of the palaeoclimate in northern Africa, which models the flow of water across the region.

One of the study's authors, Mike Rogerson, says the key elements of the simulation are satellite-derived topography of northern Africa, an Earth landscape model for modelling surface activity, and rainfall data. "Archaeologists and marine scientists all say that these fossil rivers flowed, but our team is the first to put the physics on the ground and see if it allows them to hit the [Mediterranean] coast.

"Their results, published in the open access journal PLoS ONE, point to the existence of three river systems, all of which drained northwards from the Ahaggar and Tibesti mountain ranges in central Sahara towards the Mediterranean.

The western-most of these ancient rivers, the Irharhar, would have been located in what is now eastern Algeria. The simulation indicates it flowed directly north, linking the southern mountainous regions with monsoon climates to the temperate Mediterranean climate. It was only active for about three months per year, during the monsoon season.

The Sahabi and Kufrah rivers, located about 2,000Km to the east, flowed perennially, but were shorter and ended in the arid and semi-arid regions of the desert before reaching the Mediterranean.

The researchers say that the Irharhar was the most likely to have provided a viable migration route. The supposed path of the river system is dotted with many archaeological sites dating from the Middle Stone Age. The river systems that lay to the east don't feature such sites, supporting the researchers' theory that the Irharhar river system was the preferred route for migration.

"The model clearly shows that it would have been green enough for human migration out of Africa," says palaeoclimatologist Mark Maslin of University College London. "But there would have been plenty of other opportunities for migration [in the preceding 1.8m years], and the study doesn't address why humans would have migrated at this particular time."

"Ancient rivers tell story of first migration", Moheb Costandi, 10/10/2013, online at:
http://www.nature.com/nmiddleeast/2013/131010/full/nmiddleeast.2013.178.html

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### ❖ In a Hot, Thirsty Energy Business, Water Is Prized

WITH so much focus on carbon emitted from the nation's power plants, another environmental challenge related to electricity generation is sometimes overlooked: the enormous amount of water needed to cool the power-producing equipment.

In the United States almost all electric power plants, 90 percent, are thermoelectric plants, which essentially create steam to generate electricity. To cool the plants, power suppliers take 40 percent of the fresh water withdrawn nationally, 136 billion gallons daily, the United States Geological Survey estimates. This matches the amount withdrawn by the agricultural sector and is nearly four times the amount for households.

Battles for water among these competing interests are becoming more common, and power plants are not always winning. A recent analysis by the Union of Concerned Scientists revealed many examples from 2006 to 2012 of plants that had temporarily cut back or shut down because local water supplies were too low or too warm to cool the plant efficiently.

Proposals to build new plants are also under increased scrutiny, especially in water-stretched regions. The proposed White Stallion coal plant in Texas drew opposition in part because of the plant's water demands. The project was abandoned this year.

Making homes and buildings more energy efficient and using more renewable energy would reduce some of the strain on freshwater supplies. Still, about 84 percent of the nation's electricity will most likely come from thermoelectric plants by 2040, according to the Energy Information Administration. Ensuring that there is enough water for all competing needs will require better technology and better policy, industry watchers say.

Thermoelectric plants use a fuel source — coal, natural gas, nuclear and, in some cases, solar — to boil water to make steam. The steam spins a turbine connected to a generator to produce electricity. Some form of cooling is required to convert the steam back to a liquid that can be boiled again and sent back to the turbine. Three approaches to cooling power plants are prevalent today, each with drawbacks.

So-called once-through cooling withdraws water from a nearby river or lake, cycles it through the plant for cooling, then dumps most of it back, although warmer than when it came in. While once-through systems withdraw huge volumes of water, most is returned to the source. But drawing water into the plant harms fish and other aquatic life, as does the warm water discharged.

In recirculating systems, the water used for cooling is constantly recycled. Once used, it is sent to nearby cooling towers before returning for another run through the cycle. These systems withdraw less water, but consume more than once-through systems because water is lost to evaporation (the

steam plumes you see wafting from the towers). An average 500-megawatt coal-fired plant with a recirculating system can gulp 5,000 gallons a minute to replace the water it consumes.

A third approach, dry cooling, is based on huge air-cooled condensers. These use no water for cooling, so such a system would seem to be a good solution to the problem. But they are costly, three to five times more than wet cooling systems. They are also less efficient, especially on hot days or in areas of high humidity, meaning dry-cooled plants will produce less electricity than those using wet cooling methods.

Only 1 to 2 percent of thermoelectric plants rely just on dry cooling. Hybrid systems combining recirculating wet methods and dry cooling are becoming more common, especially for new plants, said Mike Hightower, leader of the Water for Energy project at the Energy Department's Sandia National Laboratories. They can "switch between the two depending on the local weather conditions or water availability issues," Mr. Hightower said.

Newer combined-cycle natural gas plants can reduce water use by 60 to 70 percent, compared with older coal and nuclear counterparts, he said.

Researchers are busy working to make dry cooling techniques more economical, while also looking at alternative water sources like municipal wastewater, said Sean Bushart, who manages the water use innovation program with the Electric Power Research Institute, a nonprofit. Begun in 2011, the program has financed five test projects, including one by Johnson Controls, an energy and automotive products company.

Johnson Controls' Thermosyphon cooler technology is borrowed from the company's industrial refrigeration units, like those used in meat and beverage processing plants. It draws heat from the water in the cooling cycle.

"Every degree of heat we can remove from the cooling water means less evaporation in the cooling towers," said Jim Furlong, vice president in the company's industrial refrigeration group. Initial results from a test system show water savings of up to 75 percent, he said.

While water-saving technologies are evolving, less certain are regulation or policy decisions that might push power plant operators to adopt them.

"From a policy perspective, it's a really tricky issue, given that energy and water are regulated at different scales and in different ways," said John Rogers, a senior energy analyst with the Union of Concerned Scientists. "Even how water is valued and how it figures into our economic math is very different in different parts of the country, which has made it very challenging for getting a handle on this."

At the federal level, a report last year from the Government Accountability Office noted that energy planning and water planning were generally "stove-piped, with decisions about one resource made without considering impacts to the other."

Energy analysts like Mr. Rogers of the Union of Concerned Scientists want policy makers to recognize that low carbon does not always mean low water.

For example, carbon capture, which stores carbon emissions from fossil-fueled plants, adds about 20 percent to a plant's water needs. And some forms of renewable energy, likegeothermal and concentrating solar thermal, which focuses sunlight on tubes to heat a fluid, also depend on water for cooling.

What are needed are "policy decisions that link energy and water," Mr. Rogers said.

"In a Hot, Thirsty Energy Business, Water Is Prized",08/10/2013, online at: http://www.nytimes.com/2013/10/09/business/energy-environment/in-a-hot-thirsty-energy-business-water-is-prized.html?_r=1&utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=ce0c262530-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-ce0c262530-250657169&

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### ❖ World Bank 'gambling assets' by investing in private water firms

*Activists lobby World Bank to disinvest amid concerns over access to poorest communities and conflict of interest*

Civil society groups are pressuring the World Bank to disinvest from private water companies, saying that privatising ownership and management of this natural resource has failed to improve access to clean drinking water.

The World Bank is subsidising private profiteering from an essential resource by lending public money to private corporations that manage or run water utilities but have failed to improve services, says Corporate Accountability International (CAI), a Boston-based advocacy group that focuses on corporate abuse and represents an international coalition of water activists.

"The World Bank Group's reputation and assets are being gambled. Millions of people's lives are being imperiled," CAI said last month in a letter to the World Bank president, Jim Yong Kim.

The group has been lobbying the World Bank for more than 17 months to end investments by its banking arm, the International Finance Corp (IFC), in private water corporations, and has stepped up the pressure since April.

In its 2012 report, Shutting the spigot on private water: the case for the World Bank to divest, CAI laid out what it called a litany of failures by private corporations, particularly multinationals, that have failed to expand water supplies to benefit the world's poorest. Private ownership or management of water utilities, encouraged by and funded by the IFC, has diverted money critical for maintaining water systems into shareholder dividends, executive pay packages and corporate taxes, it said.

IFC officials concede that not all contracts with private companies for water utilities have proven successful, especially the early World Bank forays in the 1990s, and that privatisation is not the only solution for improving the delivery of potable water.

But 2010 World Bank research into public-private partnerships for urban water utilities reached more nuanced conclusions about a sector fraught with political problems, IFC water specialist Patrick Mullen said.

Its research found that private operators have improved the efficiency of water systems and the quality of service, though there were no clear-cut benefits on tariffs or access to water. The biggest contribution from private participation came from efficiencies, such as reducing the amount of water

lost through leaky pipes and better bill collection, which produces rising revenue streams. More money allows water utilities to make capital improvements and further upgrade systems, leading to more hours of service and better quality water and better municipal health, it said.
"Ideologically, we are not pressing one ownership or the other. We are just trying to support effective water utilities, whether they are public or privately held," Elena Bourganskaia, IFC global head of water and municipal infrastructure, said.

**Disagreements**

One disagreement between the World Bank and the CAI, which represents a coalition of 75 individuals and activist groups worldwide, centres on the way the World Bank leverages its resources to attract private capital to invest in developing economies.

CAI sees no appropriate role for private company management or ownership of water utilities and hence opposes World Bank funnelling investment toward the sector.

Kim, on the other hand, has said the public sector cannot raise enough capital to finance the infrastructure investment needed, so the World Bank must attract private sector money if it is to help countries develop.

Another area of disagreement focuses on the role of water as a scarce natural resource essential to life. CAI and water activists view water as a commodity that should be provided without profit for the wellbeing of all. The World Bank takes a more pragmatic approach based on who can deliver safe drinking water effectively to the most people.

Both sides agree, however, that expanding access to safe drinking water is a high priority. About 2.5 billion people – roughly a third of the world – have inadequate supplies, multiplying the risks of water-borne diseases from dysentery to typhoid and cholera, according to World Bank and World Health Organisation data.
Poor sanitation and limited access to water lowers a country's annual gross domestic product (GDP) on average by 1.5%, and India lost output is $54bn (£33bn), nearly the entire annual GDP of Canada, the World Bank estimates.

## Litany of failure

CAI, which grew from a US-based coalition that boycotted Swiss-based Nestlé in the 1970s for marketing baby formula to poor countries, lists a range of problems it sees from privatising water:

• Private-sector ownership leads to higher water rates because companies face additional costs compared with a municipality. They must pay corporate taxes and shareholder dividends and they spend unproductive time negotiating contracts with government officials

• Infrastructure investment to improve and expand service frequently falls short

• Conflict of interest occurs when the IFC advises governments to divest from public water, then lends money to the private company bidding on the contract, and takes an equity stake in that same company

• Public accountability is reduced if water oversight boards are appointed and financed by the private water company.

## Private sector role

The World Bank survey of public-private partnerships concludes that while privatisation is fraught with political risks and a high degree of uncertainty, it does have a valuable role to play in introducing competition to improve performance in water utilities, which often are huge inefficient bureaucracies.

In June, Kim responded to the concerns of civil society groups. He said while it was keen to examine any problems with private participation in World Bank water projects, "we do not believe that our work disproportionately emphasises private ownership".

The World Bank invested $4bn in public sector water improvements in fiscal year 2011, dwarfing the $96m in financing from the IFC for private-sector ventures, it said. Its total portfolio that year was $57bn, making water roughly 7% of its investments.

"Neither the public nor the private sector alone can meet the challenge of ensuring that everyone has sustainable access to water and sanitation services. Rather both the public and private sectors have to learn from each other to maximise delivery," Kim said.

Progress, meanwhile, has been made in improving access to water over the past 20 years. The share of people connected to a public standpipe or protected well or spring had risen to 89% worldwide by 2010, up from 76% in 1990, the UN reports.

"World Bank 'gambling assets' by investing in private water firms", 07/10/2013, online at: http://www.theguardian.com/global-development/2013/oct/07/world-bank-private-water-firms?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=5aa110335b-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-5aa110335b-250657169

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### ❖ Plenty of Water, but Little to Drink

Four Books Explore Humans' Relationship With Water

Earth, "the blue planet," has a lot of water. Most of the planet's surface is covered with it. But less than 5 percent of that water is fresh, and much of that is locked up in ice sheets or inconveniently far underground. And it is not always most abundant where it is most needed.

As a result, we are drawing on underground aquifers faster than they can recharge. And the water we have is often polluted by sewage, industrial waste, parasites and other contaminants that can make "natural" water unsafe to drink.

In short, as James Salzman puts it in "Drinking Water," one of four new books that dive into our species' relationship with water, clean supplies have always been the exception, not the norm. As recently as 1900, he writes, 1 in 70 Americans died of a waterborne disease before age 70.

Though he ranges widely, Mr. Salzman, who teaches law and environmental studies at Duke, focuses on what one might call social justice. Access to water may be viscerally regarded as a "right," but he points out that the best way to ensure a reliable supply of pure water, especially in poor regions, is often to privatize it.

Water management has been critical to economic, social and cultural development for thousands of years, Steven Mithen tells us in "Thirst." An archaeologist at the University of Reading in England, Dr. Mithen covers a vast portion of the ancient world: water storage in ancient Sumeria, the terra cotta pipes of classical Athens and the aqueducts of Rome, the "hydraulic city" of Angkor Wat in Cambodia, the water-allocation policies of the Maya.

His tone is academic and at times highly technical, but he builds to a striking conclusion. Though we may think that the rise of complex social and economic networks enabled ancient cultures to manage their water, the reverse may well be true: only when a society had reliable access to water could it turn itself into an economic or cultural power.

If some ancient empires acquired their water by conquest, so, in its way, did a much later empire: New York City. In "Empire of Water," David Soll describes how the city transformed its notoriously unsanitary water system in the early 20th century by buying up watersheds in the Catskill Mountains and building a large network of reservoirs, pipes, tanks, sampling stations and other devices that delivers a billion gallons a day of excellent water into the city's homes and businesses.

For Dr. Soll, a historian who focuses on water issues in his work at the University of Wisconsin-Eau Claire, this past is fraught with political deal making, hubris, unintended consequences and

government overreach. But in the end, "the willingness of Catskill residents and city officials to embark on the world's most expensive and ambitious watershed management program after almost a century of bitter conflict" offers hope that the goals of sensible water management and environmental progress "are not as elusive as they may seem." As for waste, a first step in avoiding it is to recognize how much water we use each day, counting not just water for flushing, bathing, washing and watering the lawn, but also the water use embedded in the food we eat, the products we buy and the electricity that powers our lives.

How much is that? A lot, according to Wendy J. Pabich's "Taking On Water."

Dr. Pabich, an environmental scientist and water activist who lives in a dry region of Idaho, says the average American uses 100 times as much water as, say, the typical Mozambican — a level of waste brought home to her when she realized she and her husband were using thousands of gallons each month to irrigate their garden.

Her book recounts their effort to cut back their water habit, by a lot. Along the way, she discovers how much water is lost to leakage in the United States — a trillion gallons a year — and how low its price is related to its value and growing scarcity.

At times Dr. Pabich's environmental correctness can be wearying. And her suggestions for reducing water use are mostly self-evident: fix leaks, install low-flow toilets and water-miser washers, turn off the shower while you lather, and so on.

But she also supplies a chart detailing the "water footprint" of various commodities. For example, it takes 22.8 gallons of water to produce, package and ship a single egg. A pound of beef requires 183 gallons. By contrast, strawberries come in at 3.6 gallons per cup, and it takes only 1.3 gallons of water to produce a tomato.

The results of her experiment are both gratifying and alarming. She and her husband did cut their water use in half, but that took them only to the level that residents of places like Japan or Poland routinely achieve.

Perhaps, she and others write, people would think more about water if it were priced differently. Cheap water may reflect a widespread view that access to clean water is a natural right that everyone, rich or poor, should enjoy.

Is that the approach most likely to bring clean water to the most people? Maybe not. "Clean water is no longer a free gift of nature," Dr. Soll writes. It is "a shared resource that can be preserved only through judicious investments and active engagement."

"Plenty of Water, but Little to Drink", 08/10/2013, online at: http://www.nytimes.com/2013/10/08/science/earth/four-books-explore-humans-relationship-with-water.html?_r=0&utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=5aa110335b-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-5aa110335b-250657169

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### ❖ Water holds key to sustainable development, UN chief tells Budapest summit

8 October 2013 – Secretary-General Ban Ki-moon today stressed the vital role of water in sustainable development, highlighting in particular its importance with regard to food security, climate change and sanitation.

"Water holds the key to sustainable development. We need it for health, food security and economic progress," Mr. Ban said in his opening remarks at the Budapest Water Summit. "Yet, each year brings new pressures."

He noted that by 2030, nearly half the global population could be facing water scarcity and demand could outstrip supply by 40 per cent.

"We must address unsustainable use… We must use what we have more equitably and wisely. We cannot expect governments to do this alone. Guaranteeing a water secure world will require the full engagement of all actors, not least the world of business."

Mr. Ban noted that agriculture is by far the largest user of freshwater, and there is growing urgency to reconcile its demands with the needs of domestic and industrial uses, especially energy production.

"Small farmers and industrial giants alike must learn to get more crop per drop," he said. This means improved irrigation technologies, and less water-intensive and more climate-resilient crops.

Climate change, he continued, poses the risk of diminished water supplies in much of the world.

"We must make sure that water remains a catalyst for cooperation not conflict among communities and countries," Mr. Ban said.

The UN stands ready to assist in this area, he added, noting for example the UN Development Programme's (UNDP) Shared Waters Partnership that is supporting political agreement on common resources, such as in the Nile Basin.

He recalled that last month, the Intergovernmental Panel on Climate Change (IPCC) reported that climate change is affecting the global water cycle, noting that 'extreme precipitation events' will very likely become more intense and more frequent by the end of this century, as global surface temperatures increase.

"In layman's terms, this means more floods," said Mr. Ban. "We will also see more droughts.

That is why we must do everything we can to keep global temperature rise to below 2 degrees Celsius above pre-industrial levels. To do that, we need to finalize a robust legal agreement on climate change in 2015."

He added that water and sanitation feature large in the anti-poverty targets known as the Millennium Development Goals (MDGs), whose deadline is 2015. While the MDG target for providing access to improved water sources has been reached, 780 million people lack this basic necessity.

"Roughly 80 per cent of global wastewater from human settlements or industrial sources is discharged untreated. Water quality in at least parts of most major river systems still fails to meet basic World Health Organization standards. Close to one-third of people drink water that endangers health. Even more people lack adequate sanitation."

"Some 2.5 billion people lack the dignity and health offered by access to a safe, decent toilet and protection from untreated waste," he continued. "One billion people practice open defecation. Diarrhoea is the second biggest killer of children under five in the world after pneumonia…

"It is plain that investment in sanitation is a down-payment on a sustainable future," said Mr. Ban. "Economists estimate that every dollar spent can bring a five-fold return."

The Secretary-General said water and sanitation are obviously central to efforts to achieve the MDGs and must figure prominently in the post-2015 development agenda. "Beyond 2015, our aim is to eradicate extreme poverty and hunger, and to create an equitable world of opportunity for all.

"Our societies cannot prosper without clean, plentiful freshwater. People cannot thrive without adequate sanitation."

Speaking at a joint press encounter with Hungarian President János Áder, Mr. Ban said he was impressed by the turnout of many leaders from all around the world for the summit. "More and more countries recognize that water should be a source of common cause – not of conflict or not of concern," he noted.

He also highlighted Hungary's important international role in this effort, noting that it is a leader in the UN Group of Friends of Water, which is promoting wider understanding and cooperation on water issues.

"I also count on Hungary's leadership on other long-term challenges. Poverty, environmental degradation and climate change will all define humanity's fate in the future. That is why our campaign for sustainable development is so important."

In addition to a working lunch with Mr. Áder, the Secretary-General also met separately with Hungarian Prime Minister Viktor Orbán; Prince El Hassan bin Talal of Jordan, Chairman of the UN Advisory Board on Water and Sanitation; and Lamberto Zannier, Secretary-General of the Organisation for Security and Cooperation in Europe (OSCE).

Mr. Ban also delivered a lecture at Budapesti Corvinus University, where he received an honorary doctorate on behalf of the UN. He told students and faculty that they must do two things.

"First, spare no effort to reach the MDGs by the 2015 deadline. Second, define a new set of goals for the new set of challenges facing our world," he said. "Now more than ever, sustainable development – integrating economic development, social inclusion and environmental sustainability – must be our global guiding principle."

"Water holds key to sustainable development, UN chief tells Budapest summit", 08/10/2013, online at: http://www.un.org/apps/news/story.asp?NewsID=46214&Cr=water&Cr1#.UlfvC9K8ka5

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## ❖ By 2047, Coldest Years May Be Warmer Than Hottest in Past, Scientists Say

If greenhouse emissions continue their steady escalation, temperatures across most of the earth will rise to levels with no recorded precedent by the middle of this century, researchers said Wednesday.

Scientists from the University of Hawaii at Manoa calculated that by 2047, plus or minus five years, the average temperatures in each year will be hotter across most parts of the planet than they had been at those locations in any year between 1860 and 2005.

To put it another way, for a given geographic area, "the coldest year in the future will be warmer than the hottest year in the past," said Camilo Mora, the lead scientist on a paper published in the journal Nature.

Unprecedented climates will arrive even sooner in the tropics, Dr. Mora's group predicts, putting increasing stress on human societies there, on the coral reefs that supply millions of people with fish, and on the world's greatest forests.

"Go back in your life to think about the hottest, most traumatic event you have experienced," Dr. Mora said in an interview. "What we're saying is that very soon, that event is going to become the norm."

The research comes with caveats. It is based on climate models, huge computer programs that attempt to reproduce the physics of the climate system and forecast the future response to greenhouse gases. Though they are the best tools available, these models contain acknowledged problems, and no one is sure how accurate they will prove to be at peering many decades ahead.

The models show that unprecedented temperatures could be delayed by 20 to 25 years if there is a vigorous global effort to bring emissions under control. While that may not sound like many years, the scientists said the emissions cuts would buy critical time for nature and for human society to adapt, as well as for development of technologies that might help further reduce emissions.

Other scientists not involved in the research said that slowing emissions would have a bigger effect in the long run, lowering the risk that the climate would reach a point that triggers catastrophic changes. They praised the paper as a fresh way of presenting information that is known to specialists in the field, but not by the larger public.

"If current trends in carbon dioxide emissions continue, we will be pushing most of the ecosystems of the world into climatic conditions that they have not experienced for many millions of years," said Ken Caldeira, a climate researcher at the Carnegie Institution for Science in Stanford, Calif.

The Mora paper is a rarity: a class project that turned into a high-profile article in one of the world's most prestigious scientific journals.

Dr. Mora is not a climate scientist; rather he is a specialist in using large sets of data to illuminate environmental issues. He assigned a class of graduate students to analyze forecasts produced by 39 of the world's foremost climate models. The models, whose results are publicly available, are operated by 21 research centers in 12 countries, and financed largely by governments.

Thousands of scientific papers have been published about the model results, but the students identified one area of analysis that was missing. The results are usually reported as average temperature changes across the planet. But that gives little sense of how the temperature changes in specific places might compare with historical norms. "We wanted to give people a really relatable way to understand climate," said Abby G. Frazier, a doctoral candidate in geography.

So Dr. Mora and his students divided the earth into a grid, with each cell representing 386 square miles. Averaging the results from the 39 climate models, they calculated a date they called "climate departure" for each location — the date after which all future years were predicted to be warmer than any year in the historical record for that spot on the globe.

The results suggest that if emissions of greenhouse gases remain high, then after 2047, more than half the earth's surface will experience annual climates hotter than anything that occurred between 1860 and 2005, the years for which historical temperature data and reconstructions are available. If assiduous efforts were made to bring emissions down, that date could be pushed back to 2069, the analysis found.

With the technique the Mora group used, it is possible to specify climate departure dates for individual cities. Under high emissions, climate departure for New York City will come in 2047, the paper found, plus or minus the five-year margin of error. But lower emissions would push that to 2072.

For Beijing, climate departure would come in 2046 under high emissions, or 2078 under lower emissions. The dates for Moscow are 2063 and 2092; for Washington, 2047 and 2071.

Perhaps the most striking findings are in the tropics. Climate variability there is much smaller than in high latitudes, and the extra heat being trapped by greenhouse gases will push the temperature beyond historical bounds much sooner, the research found. Under high emissions, the paper found a climate departure date of 2031 for Mexico City, 2029 for Jakarta and for Lagos, Nigeria, and 2033 for Bogotá, Colombia.

Many people perceive climate change to be most serious at the poles, and the largest absolute changes in temperature are already occurring in the Arctic and parts of Antarctica. But the Mora paper dovetails with previous research suggesting that the biggest risks to nature and to human society, at least in the near term, may actually be in the tropics.

People living in the tropics are generally poor, with less money to adapt to climate change than people in the mid-latitude rich countries that are burning the most carbon-based fuels and contributing most of the emissions. Plants and animals in the tropics also are accustomed to a narrow temperature range. Organisms that do not have the genetic capacity to adapt to rapid climatic changes will be forced to move, or will be driven to extinction, climate scientists say.

“I am certain there will be massive biological and social consequences,” Dr. Mora said. “The specifics, I cannot tell you.”

“By 2047, Coldest Years May Be Warmer Than Hottest in Past, Scientists Say”, 10/10/2013, online at: http://www.nytimes.com/2013/10/10/science/earth/by-2047-coldest-years-will-be-warmer-than-hottest-in-past.html?partner=rss&emc=rss&_r=1&

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### ❖ Women and Climate Action

On Sept. 27, 2013, the latest Assessment Report by the United Nations Intergovernmental Panel on Climate Change (IPCC) was released, reaffirming anthropogenic global warming as "unequivocal," and calling for "substantial and sustained reductions" of greenhouse gas emissions. Many other scientific studies warn that in the years ahead global warming and climate change will almost inevitably lead to an increase in environmental disasters, including severe drought, long heat waves, torrential rain, and more violent storms. Geologists also warn that global warming and the melting glaciers are likely to increase earthquakes, tsunamis, and volcanic eruptions in the years ahead.

Climate-related disasters have different impacts on different social groups; poor communities in the Global South and women face the most severe deprivation. Worldwide an estimated 80 percent of climate refugees -- people displaced by environmental disasters -- are women. Moreover, climate-related gender disparities tend to be most extreme in countries with entrenched, longstanding gender inequalities that restrict women's physical and social mobility. For example, in the Bangladesh cyclone of 1991, almost five times more women died than men because women could not swim, wore restricting clothing, or were forced to place themselves in extreme danger because they had to wait for a male to accompany them. Men who had access to public spaces were able to warn each of the danger but did not always inform their families left at home.

The feminization of poverty has led to a sharp gender disparity in poverty levels, and thus women on average have a smaller carbon footprint than men. Yet poor women around the world are more vulnerable to climate change, destruction of biodiversity, and loss of livelihood than groups with higher levels of consumption and pollution. Many women of the Global South rely on natural resources and ecosystems for subsistence and income. Unpredictable temperatures, drought, and flooding pose enormous challenges for women who, as the primary and often sole caregivers, are responsible for providing food, water, and firewood for their families. With reduced access to water and crops, the time spent on obtaining necessities increases.

In many countries of the Global South, the majority of farmers are women. Women produce between 60 and 80 percent of all food in the developing world, yet they own only about ten percent of all agricultural land and hold about two percent of land rights. Women as a group also have greater difficulty gaining access to education, income, land, livestock, and technology. Climate change may negatively impact female farmers more than male farmers by increasing burdens placed on women by further limiting their access to natural resources, employment, and other amenities. Thus it is impoverished women who bear the increasingly untenable consequences of climate change induced "eco-catastrophes."

Thus far, the global political and business elite has failed to take meaningful action. Yet as the human toll rises intolerably, an unprecedented climate movement is sweeping across the world. Women have often spearheaded environmental movements in their countries and regions. The Chipko Movement

against deforestation in India, the Green Belt movement for tree planting in Kenya, and the movement against nuclear testing and toxic dumping in Micronesia are just a few examples. While the United Nations General Assembly was convening in Manhattan this September, the first International Women's Earth and Climate Summit was held in nearby Suffern, N.Y., on Sept. 20-23, drawing women leaders from 35 countries to bring attention to the climate emergency. An excerpt from their Declaration states:

*"The science is clear. There is no more debate. The time for action is NOW. We will answer humanity's increased vulnerability with our increased commitment. We know that while women are among the most negatively impacted by climate disruption, we are also key to creating climate solutions... Cancel plans for future carbon developments and bring atmospheric CO2 concentrations back below 350 ppm [parts per million]; divest from dangerous and dirty fossil fuel developments -- coal fired power plants, oil shale fracking, deep-water oil drilling and Tar Sands, and rapidly phase out fossil fuel subsidies; put a price on carbon and implement carbon-fees and Financial Transaction Taxes... "*

This Declaration needs to be widely disseminated, endorsed by activists and used to put pressure on lawmakers to take climate action nationally and on the global scale. And yet, while recognizing the tremendous efforts of female environmental activists and eco-feminists, we must be careful not to allow a focus on gender inequality to deflect attention from the intertwined issues of corporate globalization and widening North-South inequalities across the world and within women as a group. We must also consciously avoid making generalizations about women's vulnerability and virtuousness, which could lead to an increase in the responsibility of women, especially poor women in the South, for mitigating climate change. Rather than separating women's issues from other progressive agendas, women's climate action needs to be an integral part of the global social movement for climate and social justice.

"Women and Climate Action", 09/10/2013, online at: http://www.huffingtonpost.com/asoka-bandarage/women-and-climate-action_b_4070928.html

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### ❖ Global panel seeks economic solutions to climate change

Will curbing greenhouse gas emissions hurt the global economy? A new global commission plans to look at the costs — and savings — of fighting climate change. It will publish its findings next year.

Energy efficiency has more potential to reduce greenhouse gas emissions than any other single current option, the World Bank's former chief economist Lord Nicholas Stern said Friday in co-launching a global panel to find cost-effective solutions to climate change.

Boosting efficiency could provide 30% to 40% of needed carbon reductions while also lowering energy bills for businesses, governments and homes, Stern told reporters. He said there's also plenty of new energy technologies, including tidal power and smaller nuclear power plants, that have emerged since his landmark 2006 "Stern Report," which warned that rising temperatures could cost the world up to 20% of its economic output.

Stern joined Mexico's former president Felipe Calderon at a press briefing in Washington, D.C., to describe their effort to develop a win-win road map for curbing heat-trapping emissions while promoting economic growth. Their Global Commission on the Economy and Climate plans to put its best ideas forward in a September 2014 report — prior to the next major United Nations climate change conference in Paris in 2015.

Calderon, the panel's chairman, said the world's scientists have presented the latest and best research on climate change in the Intergovernmental Panel on Climate Change's Fifth Assessment Report, the first part of which was released last month. The report said with heightened certainty that human influence has been the dominant cause of global warming since the mid-20th century.

"Now it's time for the economists to make their case," said Calderon, former chairman of state oil producer Petroleos Mexicanos. He said many policymakers assume that reducing emissions will erode economic growth but said that's not the case, adding the panel will analyze the costs and financial savings of fighting climate change.

"This is all about risk management," said Stern, the panel's vice chairman, noting that the IPCC's report shows how global warming will soon result in historically extreme climates. As a result, "We

have to de-carbonize energy by the end of this century," he said, citing the need for energy such as solar, wind or nuclear that doesn't emit carbon dioxide.

"This looks to be a radical change, but an exciting one," he said. While he pointed to both energy-efficiency gains and the solar industry's plummeting prices, he said: "There's no single technology we should bet on."

Stern and Calderon acknowledge there are challenges ahead, not the least of which is U.S. politics. Congress hasn't been able to pass even a bi-partisan energy-efficiency bill backed by both environmental and business groups, because Senate Republicans recently sought to attach a provision thwarting President Obama's Affordable Health Care Act.

The commission's $9 million "New Climate Economy" study was commissioned by seven countries: Columbia, Ethiopia, Indonesia, South Korea, Norway, Sweden and the United Kingdom. It will be undertaken by seven research groups on five continents, including the Washington-based World Resources Institute, which hosted the media briefing.

“Global panel seeks economic solutions to climate change”, 11/10/2013, online at:
http://www.usatoday.com/story/news/nation/2013/10/11/panel-economic-solutions-climate-change/2966129/

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