

# ORSAM

# ORSAM WATER BULLETIN

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Issue 120

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#### International Water Conference "Blue Peace" Held in Istanbul

The report entitled, "The Blue Peace: Rethinking Middle East Water" was launched by Strategic Foresight Group (SFG) on January 2011 with the support of the Swedish International Development Cooperation Agency and the Swiss Agency for Development and Cooperation. In the report, it was stated water can be harnessed in a way that satisfies the social and economic needs of people as an instrument for peace and cooperation. Within the framework of short-term objectives, this report which envisages to establish a Cooperation Council defines the functions to be undertaken by the Council as follows: to assess principles of cooperation; to create regional protocols, guidelines; to set goals for restoration of water bodies from an ecological perspective, similar to EU Framework Directives; to develop specific means of combating climate change and drought; to develop new technologies for environmentally sensitive and energy efficient water related technologies; to establish early warning and disaster management systems; and to prepare ground for integrated water resource management at the basin level. Within this scope, the report which focuses on small basins of the Middle East underlines that it is necessary to deal with the Orontes River, which makes Turkey, Syria and Lebanon riparian countries; El Kabir where Lebanon and Syria are riparians; and Yarmouk River which is shared by Jordan and Syria, and also the largest tributary of the Jordan River. In the plan designed to provide integrated management in the aforesaid basins; to provide a comprehensive and coordinated database, and to prepare mathematical modelling to be used to evaluate the surface and groundwater resources are of top priority. The inconsistency of data on regional water resources is always on the agenda. The real situation of the basins will be revealed by obtaining reliable information. The plans envisaged within the report focus on modern irrigation technologies, and effective management of water in terms of quality and quantity. Accordingly, surface irrigation method used in the area with high evaporation rate where water is already a limited resource leads to loss of water to a considerable extent and also salinization in the soils. Developing modern irrigation methods would make it possible to use less water and also it would protect the soil. Institutionalization is in the last pillar of the plan. It was planned for riparian governments, local authorities and technical committees to participate in joint river basin commissions to be established.

The institutionalization which grabs attention in the report is quite determinant in cooperation processes. Because in the regulations related to transboundary water allocation of all states, reliable



technical data on basins is required to establish right policies that would make it possible to reach objectives. Within this framework, cooperations that could be carried out among the government agencies also play an important role. Studying the structure of cooperations to solve the water problems, it was suggested that water problems in institutionalized regions are solved in a much easier way as in the examples of Europe and the U.S. It was also asserted that such institutionalizations would also help solving water problems in the Middle East.

On 18-19 March 2013, some 2 years after this report was published, the "Blue Peace in the Middle East: International Media Conference" was held in Istanbul. The Conference which was co-hosted by the journal Turkish Review and Bombay-based Strategic Foresight Group (SFG) was organized in cooperation with the Swedish International Development Agency. Besides, Bahçeşehir University and the Swiss Agency for Development and Cooperation also take part in the aforesaid cooperation.

During the two-day Conference, while media's point of view on Blue Peace was dealt with, the Blue Peace project was discussed as well. In the following sessions, the structure of commissions of Rhine and Danube river basins and their roles in cooperation process, as well as the cooperative experiences based on joint studies on transboundary waters in Africa and Asia were discussed. On the last day of the meeting, subjects such as the experiences and lessons learned from the Middle East and other regions, and establishing media network for Blue Peace were discussed.

Danube and Rhine river basins are respectively composed of 19 riparian and 9 riparian countries. Those rivers, which are used for navigation purpose also go through severe quality and flood problems. The cooperation process in both basins has been continuing for approximately a century. Pollution and flood problem is a transboundary problem that affects all riparians, and cooperation is an inevitable process in both basins. It facilitates the cooperation compared to the basins where quantity of water is a problem. Those two model cooperations dealt with in the conference was envisaged to be an inspiration for the Middle East. However, the Middle East is a region where semi-arid and arid climate prevails and water shortage is at a severe level. In transboundary basins with water quantity problem, the formation process of agreements on water supply is not that simple. Especially in the regions that with a great number of conflicts like the Middle East, the mutual trust



issues among the countries, food safety, water as a national interest and security issue have an impact on this process.

In the meeting where many local specialists, academicians, politicians and journalists and those mostly coming from the Middle East participated, the attendants said that they could not relate water and war, and that they concentrated on water as an instrument for peace. The project was designed for the Middle East where semi-arid and arid climate as well as water shortage prevails, and it was envisaged to solve the problem by the countries in the region. It was mentioned that the water shortage also affect the amount of products. Studying the literature and the news, the water issue is mentioned along with conflicts and crises. Hence, "Blue Peace" was created. The Blue Peace was firstly launched in the Middle East, and then spread to Maghreb countries and Asia. First of all the workshop that includes the Blue Peace report was carried out and then "high-level committee" was formed within the scope of the Blue Peace project which continues in a two-stage process. The Blue Peace mainly focuses on the access to sufficient amount of quality water in the region and cooperation, and it strives to further bring up this project to the forefront on the occasion of 2013 International Year of Water Cooperation.

Journalists, on the other hand, mentioned that they did not know the whole history of water, they had difficulty in finding information on the subject, and that it is necessary to establish a communication network between water specialists and journalists, and to share information. As a result of the meeting, the importance to establish a network that would pave the way for sharing experience, to inform people in the media sector about water, and for media to raise awareness on water in the public in order to manage water resources in cooperation was emphasized. Besides, it was also stated that to mention water along with the concept of cooperation instead of conflicts and wars in media could have a positive impact on the "Blue Peace" process.

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<sup>&</sup>quot;International Water Conference "Blue Peace" Held in Istanbul", ORSAM, Tuğba Evrim Maden, 21/03/2013, online at: http://www.orsam.org.tr/en/WaterResources/showAnalysisAgenda.aspx?ID=2194



#### Blue Peace approach is the way to go

Since the UN declared 2013 as the International Year for Water Cooperation, the World Water Day on March 22 assumes a special significance this year.

Empirical evidence indicates that where countries cooperate over shared rivers, lakes and other water bodies, they enjoy peace and prosperity. Conversely, where countries do not enter into cooperation for collaborative development of shared water resources, they tend to experience tensions and conflicts.

There are about 100 shared water bodies in Europe and North America. Most of them are covered by regional water cooperation arrangements. The commissions to protect Rhine and Danube rivers in Europe, Colorado river between the US and Mexico and the Great Lakes between the US and Canada, the European Union (EU) Framework Directive for continental cooperation to improve the quality of all water resources and the Helsinki agreement, promoting regional water cooperation, are all well known. All countries which are actively involved in implementing these and other smaller agreements enjoy friendly and peaceful relations.

In Africa, all riparian countries sharing the Senegal river basin are engaged in multi-fold cooperation and enjoy peaceful relations. On the other hand, the Lake Chad Basin Commission agreement is weak and the Nile Basin Initiative is confined to technical cooperation. There are tensions and conflicts between Sudan and South Sudan and occasional sabre-rattling between Egypt and Ethiopia. There are constant tensions and at times violent conflicts in 35 out of Africa's 50 shared basins, where the countries have not entered into water cooperation arrangements.

The Middle East is conspicuous for almost total absence of cooperation over shared rivers and aquifers. There are merely water allocation agreements between Iraq, Syria and Turkey for Tigris and Euphrates, between Syria and Lebanon for Orontes, Jordan and Syria over Yarmouk river and between Jordan and Israel over the Jordan river. Cooperation between Iraq, Syria and Turkey has not gone beyond meetings of officials and training programmes. The Joint Water Committee between Israel and the Palestinian National Authority (PNA) is defunct.

In the absence of cooperation, water bodies in the region have suffered badly.



The Yarmouk river declined from 600mcm (million cubic metres) to about 250-300mcm per year, while the Jordan River from 1,300mcm to 100mcm in the last 50 years. The Ceyhan and Seyhan rivers in Turkey, which former president Turgut Ozal had proposed to provide water to the Gulf countries, no longer have any surplus.

The water level in the Dead Sea dropped from 390 metres below sea level in the 1960s to 420 metres below sea level at present and will be 450 metres below sea level by 2040. The water surface area has shrunk by a third, from 950 square kilometres to 637 square kilometres.

The renewable freshwater resources in the Mountain Aquifer, shared by Israel and the Palestinian Territories, at the time of the Oslo Accords, have been reduced by 7 per cent from 1993 to 2010 and in the Western Galilee Aquifer by 15-20 per cent.

If these trends continue for the next 40-50 years, the Middle East will face serious humanitarian crisis.

The only alternative is Blue Peace, whereby water is converted from a cause of potential conflict to an instrument of cooperation. The Blue Peace approach calls for engagement of the top political leaders in promoting water cooperation, establishing sustained mechanisms for regional cooperation and using regional cooperation mechanisms to agree on trade-offs, joint investment programmes and joint development and dissemination of modern technologies for renewing water resources.

Some actions can be initiated immediately, without any significant political or economic costs.

• Turkey and Iraq often make different claims about the actual flow of Euphrates River. It should be possible to install monitoring stations jointly managed by Turkey and Iraq on the Turkish side of the Turkey-Syria border and the Iraqi side of the Syria-Iraq border with technical personnel from both countries and agreed standards of gauging stations and calibration software. Once Syria has a stable state, it can join this arrangement.

• Turkey has launched an ambitious 20 billion euro (Dh94.68 billion) programme to upgrade the quality of its fresh water bodies in cooperation with the EU. Iraq, Lebanon, Jordan and eventually Syria can enter into cooperation with Turkey to benefit from its technology and management capacities.



• Saudi Arabia, Iran, Turkey, Qatar and the UAE can enter into an agreement to use their respective strengths in the region to persuade the Al Assad regime as well as its opponents not to damage the water infrastructure in the current conflict and also to grant Red Cross safe access to repair damaged water infrastructure.

• Scientific institutions across the Middle East can begin joint programmes, in partnership with EU and the US, for developing new technologies such as reverse osmosis, nano-technology and solar technology for water treatment.

In order to bring about cohesion in such efforts, it is necessary to establish a Cooperation Council for the Sustainable Management of Water Resources. Iraq, Jordan, Lebanon and Turkey can form such a Council to be expanded to include Syria when possible and to have relationship with the PNA and Gulf states in the future. Such a phased evolution of the cooperation council will gradually foster cooperation and joint investment programmes — not only in the water sector, but also in combating climate change and drought, agriculture, health, disaster response, tourism and infrastructure. It will eventually lead to sustained peace, friendship and prosperity for the people of the Middle East.

Sundeep Waslekar is president of Strategic Foresight Group, a think-tank based in Mumbai with global reach.

"Blue Peace approach is the way to go", 21/03/2013, online at: <u>http://gulfnews.com/opinions/columnists/blue-peace-approach-is-the-way-to-go-1.1161237</u>

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#### Peace-of-no-other-choice: Blue Peace

The Arab-Israeli conflict contributed greatly to the dictionary of world politics. A particularly useful term the Israeli side produced to the conflict was milhamat ein-brerah, war-of-no-other-choice. Israelis claimed that Israeli attacks hitting its Arab neighbor, be they offensive or defensive in nature, were all wars that were imposed upon Israel by historical situations, if not directly by Arabs. When the era of war ended and both Israelis and Arabs started to realize that no war would end their mutual problems, an era of cold peace and peace negotiations started. The realities on the ground are reflected in the dictionary in either neologisms or slight changes to the established terms. Some Israelis didn't want the sort of peace the conditions imposed, but they realized they had no other choice. This realization gave birth to shalom ein-brerah, peace-of-no-other-choice. This term has the potential to be cut off from its original context and be used for any kind of peace imposed on the sides of a conflict by basic human needs and geographical realities.

Blue Peace is such a peace-of-no-other-choice. Countries that share sources of drinking water have no other choice than to create supranational bodies controlling the daily operation of water management systems. This is particularly true for cross-border rivers. Turkey is both an upstream and a downstream country. As major sources of drinking and irrigation water, the Euphrates and Tigris rivers have always been an issue of contention between Turkey, Syria and Iraq. But Turkey is also a downstream country in the case of the Orontes and Maritza rivers and is suffering from a lack of cooperation with its neighbors in regard to water management.

Water experts love to speak about drought; experts in international politics love to evaluate possible wars. When water experts come together with these experts in international politics, they talk about water wars. Only farsighted idealists realize that the basic human need for fresh water will eventually trivialize our lust for control over land and resources and force us to create cooperative bodies. People with a bit more virtue will realize that cross-border bodies created to solve strategic problems have the potential for survival and the capability of being used to solve other unrelated problems. The European Union was not created as an economic and political union. It was a gathering of countries producing coal and steel that realized the need to coordinate their efforts of feasible production and



marketing.

The day after the waves of Arab Spring are over, the water-sharing issues will come to the agenda. Then the region will have only one option: peace-of-no-other-choice. The late Turkish President Turgut Özal had realized the potential of water pipelines creating such a level of mutual dependence between countries of the region that all other issues would be trivial compared to that level of dependence. Today, the Indian-based Strategic Foresight Group is promoting Blue Peace, a project that will create such multinational mechanisms of cooperation between Middle Eastern countries that will be capable of solving other unrelated problems too.

Turkish Review is hosting the media wing of Blue Peace on March 18-19, with the Strategic Foresight Group. Together with water experts and concerned journalists from all over the Middle East, we will discuss the Blue Peace report prepared by the Strategic Foresight Group and launched by the president of Switzerland in February 2011, which had identified some of the long-term trends in depletion of rivers and lakes across the region and made 10 innovative recommendations. We hope that this first conference will lead to regular interaction through conferences and workshops between participants over the next few years and participants may decide to create a Blue Peace Media Network.

"Peace-of-no-other-choice: Blue Peace", Kerim Balcı, 13/03/2013, online at: <u>http://www.todayszaman.com/columnist-306955-peace-of-no-other-choice-blue-peace.html</u>

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#### Int'l water conference convenes for 'blue peace'

Local and international academics, politicians, analysts and journalists convened at a two-day conference tackling the issue of water in the Middle East, with participants warning of potential water shortage and stressing necessary measures to avoid drought.

The conference, titled "Blue Peace in the Middle East: International Media Conference," kicked off at Zaman's İstanbul headquarters with around 70 participants in its regular sessions in addition to 400 guests in attendance at the Grand Inaugural Session on Monday.

The event was co-hosted by the journal Turkish Review and India-based think tank Strategic Foresight Group (SFG) in partnership with the Swedish International Development Cooperation Agency. The Swiss Agency for Development and Cooperation and Bahçeşehir University also cooperated to host the event.

At the heart of the event is the SFG's "Blue Peace" project, which is centered on the principle of making water a source of cooperation rather than conflict.

In his opening speech at the event, Turkish Review Editor-in-Chief Kerim Balcı summed up the aim of the event: to prepare the ground for sharing experiences in managing regional water resources through cooperation. Underscoring the media's role in promoting and spreading knowledge and experiences regarding the issue of water management, Balcı said they aim to create awareness and sensitivity in the media about the water issue, which he described as the most critical issue for the region's future.

Balcı also pointed out that we need new words in the post-Cold War era and that "blue peace" should be one of them. He gave the example of the European Union, which first emerged as five countries gathering to discuss coal and steel production, suggesting that solidarity among Middle Eastern countries might emerge through water conferences.

Among those attending the conference were the members of the Blue Peace core group, including HRH Princess Sumaya bint El Hassan of Jordan, former Turkish Foreign Minister Dr. Yaşar Yakış, the Rt. Hon. Lord Alderdice and deputy and economic advisor to the Turkish prime minister Şaban



Dişli, senior SFG members including President Dr. Sundeep Waslekar and Vice President and Executive Director Ilmas Futehally.

Waslekar stated that the water issue has already reached a critical level of importance and that either conflict or peace may now result from it. It will be the choice of the people in the region, he added.

The Strategic Foresight Group is a think tank engaged in crafting new policy concepts to enable decision-makers to prepare for the future in uncertain times. It has worked with and in 50 countries on four continents, with a base in India.

Another speaker, Professor Murat Özler, a hydrogeology engineer at İstanbul University, warned that Turkey and the region will face the effects of global climate change in the near future and that a serious drought is expected in the region at the end of this century. "It is a reality that Turkey's current population is 75 million and it is expected to reach 100 million in 20 to 30 years. Thus, water consumption will significantly increase. The amount of water consumption per person, which is approximately 1,400 cubic meters per year, will have to fall to 700 or 800 cubic meters in the country," he said, warning of water scarcity in the future.

As for the necessary measures, Özler said that Turkey needs to stock water in dams in regions where water is scarcer. He also emphasized Turkey's geographical importance, noting that the Tigris and the Euphrates rivers in Turkey constitute the major water resources of the Middle East.

Other participants included the head of the Swiss Agency for Development and Cooperation (SDC), Michel Mordasini, Gulf News reporter Abbas al-Lawati, All4Syria online bulletin's Editor-in-Chief Ayman Abdel Nour, Jordan Times Editor-in-Chief Samir Barhoum, Hürriyet Daily News former Editor-in-Chief David Judson, Al Jazeera Türk Editor Ayşe Karabat, Turkish Water Institute President Ahmet Saatçi, Phillip Weller, executive secretary of the International Commission for the Protection of the Danube River, and İstanbul Bilgi University's Professor İlter Turan.

"Int'l water conference convenes for 'blue peace", 18/03/2013, online at: <u>http://www.todayszaman.com/news-310106-.html</u>

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### Blue Peace or Blue Problems?

# A report on water scarcity in the Middle East suggests setting up a collective water council in the region to help bring peace between countries. Changing water's role to an olive branch will be tough.

A 'master plan' on how water could bring peace to the Middle East couldn't have been published at a more apt time than the middle of February. Entitled, The Blue Peace: Rethinking Middle East Water, the report said that unless remedial measures are introduced urgently, the Middle East is likely to plunge into serious "humanitarian crisis due to depletion of water resources".

The day after the publication saw Egyptian president Hosni Mubarak resign. Five days later and the protests spread to Libya, with Colonel Gaddafi's son Saif al-Islam admitting days later that much of Eastern Libya remains under rebel control. And this list doesn't even include Tunisian President Ben Ali fleeing in January or Bahrain's protests in the middle of February. Civil protest has spread like wildfire across the region as Middle Eastern nations seek a revision of their political and governmental systems.

Given the input, depth and time required to put together such a report, there is no way the company behind it - Strategic Foresight Group - could have foreseen such civil unrest unfolding when planning its publication in February. It was also supported by the Swiss Agency for Development Cooperation and the Swedish International Development Cooperation Agency.

Interestingly, the report was prepared with the input of 100 leaders from Israel, the Palestine Territories, Jordan, Lebanon, Syria, Iraq and Turkey. The likes of Tunisia, Egypt, Bahrain and Libya were not included.

"Our choice of countries is governed by the potential of opportunities to rethink water," the authors said.

The paper highlighted some of the key water issues facing the region, such as river flows in Turkey, Syria, Iraq, Lebanon and Jordan being depleted by 50% to 90% from 1960 to 2010.

Renewable freshwater, too, has suffered. Take the Mountain Aquifer, shared by the Palestinian Territories, which has been reduced by 7% since 1993.

Figures also showed that the water level in the Dead Sea dropped from 390 metres below sea level in the 1960s, down to 420 metres below sea level currently. Predictions show this level could drop to 450 metres below sea level by 2040. If the water surface level in the Dead Sea continues to erode, it will be reduced to a lake in 50 years. Eventually, it could disappear.

The report recommended a Cooperation Council for Sustainable Water Management in Turkey, Syria, Jordan, Lebanon and Iraq. It is hoped such a council could enable the countries to have common standards for measuring water flows and quality and spread new technologies.

The Blue Peace Report suggested that such measures could lead to "broader and sustainable peace between countries in the Middle East".

Sundeep Waslekar, president of Strategic Foresight Group, said: "The region can be a harbinger of a new form of peace - the blue peace - a concept that has to be distinguished from conventional peace,



which is normally a state of harmony between wars, and green peace that relates to ecological imperative for constructive relationship between societies.

"The blue peace concept assures that no two countries that have access to adequate, clean and affordable water would ever go to a war in the twenty-first century."

Questions have also been raised on how the current wave of civil unrest will impact on the water industry and private sector involvement. Despite a report from Reuters claiming Singapore's Hylux projects in Libya could face delays due to the political uncertainty, contracts and initiatives are still being awarded in the region. Take Bahrain, where the long-awaited Muhharaq BOT wastewater treatment contract was recently awarded to an international consortium including South Korea's Samsung Engineering Company. The Middle East and Africa regional spotlight, starting on page 18, details further market activity and project overviews in the region.

In light of the expected growth, I'm pleased to announce that PennWell International will this year be developing what was the Water Track of the Power-Gen Middle East event, into a co-located event called WaterWorld Middle East. More information can be found at:

www.waterworldmiddleeast.com.

To conclude, water, as an essential commodity to life, has been fought over and the cause of disruption and wars for years. It will be interesting to see whether such "blue peace" recommendations will come to fruition and make a difference. The Libyan troubles will inevitably continue to rumble on until embattled Libyan ruler Col Muammar Gaddafi steps down. One truth is for certain: water will continue to be essential for life and there will always be a need for public and private sector expertise and technologies.

"Blue Peace or Blue Problems?", 21/03/2013, online at: <u>http://www.waterworld.com/articles/wwi/print/volume-26/issue-1/regulars/perspective/blue-peace-or-blue-problems.html</u>

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#### \* Ancient aqueducts give Iraq a trickle of hope

A millennia-old labyrinth of underground canals may help solve the Middle East's water crisis, say experts.

In the windswept plateaus of northern Iraq, unseen aqueducts which have channelled water to arid settlements for centuries are running dry. Experts say the wide-scale demise of these ancient water systems is <u>an ominous sign</u> of how scarce water in the region will soon become, and the humanitarian disasters that could follow.

For villagers here, tragic consequences have already arrived.

Farez Abdulrahman Ali strides across a muddy field and sweeps a burly arm towards the mountains that loom over Shekh Mamudian village in the wilds of Iraq's semi-autonomous Kurdistan region. This is the rugged terrain of the *peshmerga*, the Kurdish military whose name means "those who face death".

Ali explains that a subterranean canal - known in Iraq as a *karez* - once brought water to the village, where it gushed from a rock-lined tunnel into a pool just below the entrance to the local mosque. From there, it was channelled to nearby fields of okra, eggplant, onion and tobacco.

"Farmers would use the water," said Ali. "On hot days, children would play in the water. In the evenings, people would gather at the karez to talk about village things."

"The karez dates back to the time when karez were dug," he added, matter-of-factly. "Nobody in the village knows when it was dug. Even my grandfather doesn't know. It is probably 800 or 900 or 1,000 years old."

#### **Dry county**

In autumn 2011, for the first time in the village's collective memory, the karez in Shekh Mamudian went dry. As the village chief, or *mukhtar*, Ali sees the loss of the karez as catastrophic for the livestock and crops the village depends on for its hard won self-sufficiency. Unless it is restored, he fears for the end of a community that withstood assaults by Saddam Hussein's army in the 1980s, and



survived as a bloody no-man's land in the Kurdish civil war of the mid-1990s.

"The karez was the source of life," Ali said. "The village now feels like a family that has lost its father."

Echoes of Ali's lament are being heard throughout the arid mountains and plains of Kurdistan, where the widespread demise of karez is becoming a humanitarian nightmare.

Last year, an inventory of karez systems in Kurdistan - believed to be the first such compiled in modern times - found that decades of war and years of grinding drought, combined with neglect and over-pumping from nearby mechanised wells, had brought these vital water lifelines to the edge of extinction.

According to <u>a UNESCO report</u>, just 116 of the 683 karez networks located in northern Iraq were still supplying water as of August 2009. As many as 40 per cent of the region's karez have dried up in the past four years alone.

Since 2005, more than 100,000 people have been forced to abandon their homes because their karez stopped flowing, and a further 36,000 are at immediate risk of evacuating their villages, according to the UN agency.

# Parched land

In Kunaflusa, a rocky 90-minute drive north of Erbil, the village karez was last year producing only a trickle. Village mukhtar Fadel Abdullah Salah said families were allotted one-hour time slots to fill up enough water jugs to last a week.

"There is not enough water now for farming," said Salah. "If the karez runs dry, we will be forced to leave the village."

Water brought in tanker trucks by the Kurdistan Regional Government has helped the people of Kunaflusa. But experts say quick fixes such as hauling in water or drilling new, gas-fuelled wells are expensive band-aids that will ultimately prove unsustainable.



Salah said the village had some 200 houses in 1984, but today only 13 remain occupied. The UN report found that, on average, 70 per cent of residents moved away from their villages after the local karez went dry.

Whether the demise of the karez is due to mismanagement, rapacious drilling, climate change - or a combination of the three - it is certain that the widespread drying up the karez system in Iraq is unprecedented. Experts say that while individual karez have occasionally dried up in the past, they have never experienced such a rate of dehydrated in such a short span of time.

"The karez can be seen as little birds in a mine. It is mind-boggling that thousand-year-old tunnels like the karez have managed to supply water continuously and in the past ten or 20 years they have managed to dry up on a large scale. It's extremely worrying," said Joshka Wessels, a Dutch filmmaker and human geographer who has studied karez systems in the Middle East since 1998.

"This is not limited to karez communities but is [a] region-wide humanitarian disaster if droughts of this scale continue. The most common response is that people will leave and migrate to other locations. The human consequences will be enormous," she added.

#### How karez changed the world

The karez, also known as a *qanat*, is recognised as a masterpiece of early engineering. In fact, the dispersal of karez suggest that these millennia-old wonders were once the hottest "new technology" in the ancient world. Although there is some debate, the conventional wisdom is that karez were first built in Iran around 2,500 BC, and by 500 BC the Persians had spread the technology extensively throughout the Middle East and North Africa.

Ingenious in their simplicity, a karez is a series of carefully calibrated tunnels and shafts that harness gravity to draw a continuous flow of underground water to the surface. The Romans are understood to have learned the technology from either the Etruscans or the Egyptians, and went on to further spread the construction of karez - though research shows that Arabs had already built a karez in what would become Madrid by 750 BC.

The water systems eventually made their way to Chile, Peru and Mexico - and even Los Angeles, in



present-day California, in 1520AD.

Karez also travelled east, across Afghanistan, Pakistan, Central Asia and into north western China where they are prevalent, with a 5,000km network of 1,100 waterways stretching across the Xinjiang Uyghur Autonomous Region.

"They're amazing, considering the labour and materials involved and the ingenuity and engineering power it takes to create a tunnel several miles long," said Dale Lightfoot of Oklahoma State University. "They followed a gradient and made calculations and they couldn't even see what they were doing. These are amazing wonders of the world and nobody knows about them."

From an environmental standpoint, karez have the advantage of never pulling out more water than the aquifer can naturally supply. "Mother Nature manages the withdrawal," said Lightfoot. "It's an inherently sustainable system that could survive for centuries."

In Iraq the United Nations estimates that 50 per cent of all water resources are wasted and six million people have no access to clean water.

In a report released earlier this year, the UN said that, in rural areas, one in four children access their water from rivers and creeks and one in ten rely on water from tanker trucks and open wells. For Iraq, and other water-starved nations in the Middle East and North Africa, the upkeep of karez systems could preserve a vital resource. For hydrologists, saving the karez is a potent mix of cultural value, ancient science and necessity.

"These systems keep on fascinating me because the technology and sheer human effort to bring water to the desert is amazing," said Wessels. "Once you are in a tunnel like that, you can't help imagining that, despite all the current modern technology, these hand-dug hydraulic wonders are still the most sustainable way of using water in the desert."

#### Save karez, save the future

As karez continue to dry up across Iraqi Kurdistan, due to what Lightfoot calls "the double whammy" of drought and over pumping by mechanical wells, the knowledge of how to build and maintain them



is also fading away.

"The process is quite complex, but in general every ten years or so, [karez] have to be cleaned out, relined and air shafts repaired. This entails an intimate knowledge of the hydraulics of the tunnels... The traditional knowledge and oral traditions are vanishing," said Wessels.

Casey Walther, who recently led a European Union funded UNESCO project to rebuild karez in Iraq, admits that saving them is no simple task.

"The karez in Iraq are on the verge of dying out," he said. "The Anfal campaign [Saddam Hussein's war against the Kurds] was devastating on the systems in the 1980s and 1990s. This has been combined with the rise of modernity and urban migration; young people are drawn to exciting opportunities in cities, not sitting in a village learning an old trade.

"It's a loss of cultural heritage. This is real Iraqi heritage and it's on the verge of going extinct if measures aren't taken. This knowledge isn't taught in universities."

The demise of the karez wells couldn't come at a worse time for Iraq. The Tigris and Euphrates rivers are **losing** an estimated 50-70 per cent of their flow in Iraq due to increased withdrawals and damming in Turkey and Syria, while at least 250,000 tons of **raw sewage is pumped** into the Tigris river every day, "threatening unprotected water sources and the entire water distribution system".

Officials estimate that two million people have severe shortages of drinking water. Already a drought-stricken nation downstream from thirsty neighbours, the advent of climate change stands to only make matters worse.

The positive role that a revived karez system could play in mitigating this deepening water crisis is undeniable, according to experts.

"The karez are certainly part of a solution to many problems, including how to keep folks in the village and stem depopulation in the countryside; how to sustainably utilise groundwater resources instead of over-pumping the aquifers," said Lightfoot. "They could also play a role in reversing



desertification, but only if the karez are still flowing."

#### **Investment for well-being**

UNESCO's Walther points out that the "easy fix" for an area without water is to keep drilling more and deeper wells. But the karez trump the modern well in terms of sustainability and resilience to variations in climate, he noted.

"The message today is that karez, though an ancient technology, is a better solution to water scarcity in many situations today, and should be used more widely as a tool for supplementing water supplies in arid regions," he said.

"It is a simple technology that requires very little start-up investment, and if used correctly can provide enough water for small communities without exhausting the aquifer."

It seems others are listening. The government of Iran, for example, funded the development of the International Centre on Qanats and historic Hydraulic Structures - a research and training facility aimed at karez conservation.

Success stories have even emerged from Iraqi Kurdistan. In Shekh Mamudian, the village water supply has been revived and improved.

In a pioneering intervention led by Walther's UNESCO team, two experts were brought in from Iran one a young engineer and the other an elderly karez maker. The Iranian masters worked with six local men to clean out and refurbish the karez, and, after more than a month's labour, the village karez was gurgling nicely into the pool at the foot of the mosque once more.

The UNESCO team concluded that the improved flow of water was enough for the Shekh Mamudian villagers to resume old farming practices, and more karez repairs were planned in other areas.

"We thought water would never run through the karez again," said Ali, the village mukhtar. "But when the Iranians, who have a lot of experience, came, they told us we could fix it. They said there was a river under the ground and told us they would be able to bring the water up through the karez.



"We believed them and now we are very satisfied."

Despite what could be the beginnings of a karez revival in Kurdistan, the future is still bleak for the water systems amid Iraq's vast environmental problems, not to mention its endemic instability, corruption and poverty.

Kunaflusa is still struggling to get by on tanker water and a trickle from the karez. Experts worry it might be too late to rehabilitate the ancient system there.

"If you consider the functionality and ingenuity behind the karez, these are marvels of ancient scientific technology," said Walther.

"But without human intervention, these systems will stop flowing and be lost forever."

"Ancient aqueducts give Iraq a trickle of hope", 23/03/2013, online at: http://www.aljazeera.com/indepth/features/2013/03/2013323133859107294.html

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#### \* Infrastructure in Iraqi Kurdistan: Overview

ERBIL: You cannot build an instant country, but since the 2003 fall of the Hussein regime, the autonomous Kurdistan region has been accomplishing something close to this with its rapid pace of business and infrastructure construction supported by a strong boom in the oil based economy.

Driving the region's economy -- while the Kurdistan Regional Government seeks further economic diversification -- are gas and oil reserves, estimated respectively at 100-200 trillion cubic feet and 45 billion barrels, with possibly another 25 billion potential barrels in unproven reserve.

This has sparked a quickly emerging market in infrastructure construction -- including telecom, power networks, residential, commercial and educational building, roads and two airports (and soon a third) along with advance urban planning for what the KRG would like to see for the shape of the region's future.

The pace of infrastructure construction has been strong, particularly spurred by the region's progressive 2006 investment law, which has opened the door for much foreign business and FDI.

But building with such speed, and in so many different sectors poses the difficulty of coordination, priority funding, monitoring effective spending and corruption and most importantly meeting a diverse public demand for different services – all at once.

The Gallup survey organization reported last year even while the economy experienced a steady 8 percent growth in 2011, residents of the three northern provinces governed by the Kurdistan Regional Government are becoming less satisfied with their infrastructure.

Gallup reported that satisfaction with public transportation in Iraqi Kurdistan declined sharply to 23 percent in early 2012, from 54 percent the previous year. Satisfaction with housing also fell from 53 percent to 30 percent during the same period.

The Gallup organization also reported that worsening attitudes toward key infrastructure in Kurdistan found during the March polling period came after "rare protests in Sulaymaniyah last year that focused largely on services and corruption in the region."



"As the most peaceful and prosperous area of Iraq, major cities in the Kurdish region such as Erbil and Sulaymaniyah have received thousands of migrants from other parts of the country, exacerbating a growing housing crisis despite government efforts to address the issue," the survey reported.

Despite rising wage levels, and strong levels of disposable income, the citizens in Kurdistan complain about "about basic services like water, bad roads, sewage shortages and others," The Kurdish Globe recently reported.

Several of those interviewed said they purchased their water from trucks, with one taxi driver noting he only recently began using a newly constructed pipeline put in place by the local government.

On the large-scale infrastructural front, one key negative is the lack of a comprehensive highway system, which is a key necessity for commerce, transportation and to create a coherent business zone for the region.

On the plus side there are several recently completed highways in the Kurdish north. And a highway between Dukan and Sulaiymaniya is expected to begin construction soon. Also, sewerage in Erbil and Sulaiymaniya are being expanded and water treatment plants are being built, according to the KRG.

#### Road Infrastructure

Rebaz Zedbagi, Partner, Senk group, gave Marcopolis a comprehensive viewpoint to Kurdistan's roadway infrastructure, giving a breakdown on the current status quo.

"We have about 357 km of paved roads of good quality, which are considered to be highways. Then we have about 2,499 km of one-lane roads. There are also 4,086 km of secondary roads. The total of rural roads is around 3,000 km," the Senk Partner explained.

"Since 2003 we have been able to build a lot of new roads but I t is still not enough. Kurdistan needs more roads that will interconnect cities, towns and villages," Rebaz Zedbagi added. "A road is a very crucial need of life; life is spreading thanks to a road. When a road is going to a place, then everything is going there. If there is no road, people are not going to get there. Roads are very important for the development of agriculture. They are also essential for villages to renew themselves."



The SENK Group was founded in 2000 in the city of Erbil with initial activities rooted chiefly in infrastructure constructions such as roads and bridges.

The Kurdish Autonomous Region has two international airports: Airport Sulaimany and Hawler International Airport in Erbil. Both busy flight centers, given the amount of foreign company business travel to and from the region.

Also, KRG Prime Minister Nechervan Barzani performed the ground breaking for a new international airport in Duhok in late September. Duhok International Airport will be the third airport in the Kurdistan Region. After its completion in 2015, travelers will have direct international access to each of the region's three provinces. The key airport in Erbil has recently added new facilities and continues to grow markedly.

In a recent interview with Marcopolis, North Bank Chairman Nozad Dawood Fattah Al-Jaff, commentated on the increased commercial travel into Kurdistan.

"When I attend conferences and meetings and then return to Iraq after traveling, I have a hard time finding a seat on a plane going back to any part of Iraq, especially to Erbil or the whole KRG area. You have to make sure you book your tickets in advance to get a seat – and I view this as a very good sign," said the North Bank chair.

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Jawed added, "When we started in 2005 there was a zero penetration rate. Now 85 percent of the Internet of Kurdistan comes through Newroz, so for a country like Kurdistan, 50 percent (usage) by the end of 2015 is possible. I cannot predict anything for Iraq because it has been there like this for ages."

#### **Tourism Infrastructure**

In terms of business, hotels should be included on the infrastructure list – there are at least 21 major business hotels in the Kurdistan region's three main cities: Erbil, Duhok and Sulaimaniyah, owned by a variety of groups and investors. The center of much business and social action is Erbil's Rotana Hotel, part of an Emirati-owned group.

Also, there are a number of hotels are under construction including the nearly complete five-star Divan Hotel in Erbil, an \$80 million investment by a Turkish hotel group. And, the Marriott group and Kempinski group have nearly completed two large towers.

This said the KRG's policy of infrastructural and sector investment has been somewhat laissez faire as to where the government has been trying to direct FDI and other investments.



"We have had sectors open to investors on a balanced way without giving priorities to them. Now we are in a different position; we have identified our priorities and the sectors that we want to promote and the projects that will get more incentives, rather than giving the same incentives to every sector." said Herish Muharam, Chairman of the Kurdish Board of Investment, in a recent interview with Marcopolis.

He added that top priority sectors include tourism, industrial and agricultural sectors.

Muharam also note that Kurdistan is very close to signing contracts or strategic agreements with master developers "with very high profiles and professional backgrounds. We expect that as a result of these projects the industrial and tourism sectors will jump into a phase in which they will start contributing to a great extent to the economy of Kurdistan."

Dean Micheal, Chairman of ATCONZ Group, gave high praise to doing business in Kurdistan, noting: "There is a modern airport, good infrastructure, the electricity is much more stable compared to any other part of the country, and nature is beautiful. There is the ease of doing business and the fact that the government allows you to do business once you comply with their requirements. The rule of law is there, they give you protections, and the government supplies us with guards to protect the project during the building process."

The ATCONZ head added, "They are meeting and respecting their obligations towards investors who come in and they will try to help you as much as possible to make your project a success. If your project is successful, it means that they are successful and that's how they look at it.""

ATCONZ is a diversified group with business interest in investment; real estate development; the industrial sector; oil and gas trading; construction contracting and consultation.

# Dam Construction

According to the Kurdish Ministry of Water Resources there are plans to construct five large dams in the Federal Region of Kurdistan-Iraq. This includes the Daize Dam northeast of Dahuk; Litan dam northwest of the Erbil; Bistana Dam southwest of Erbil; Drash dam in the district Saladin in the province of Erbil; and the Shadala dam over the river Shramaja in the northeast of the province Sulaymaniya.



For Senk Group's Zedbagi, the more dams are a key addition to the Kurdistan's infrastructure.

"As Kurdistan has large reserves of water, a lot of underground and overground since we have abundance of rain, the water is now just soaking into the soil and we don't have any benefits from it. We need to store it to get the benefit out of it (for agriculture, tourism, electricity etc.)," Rebaz Zedbagi said. "There are only two big dams in Kurdistan at the moment and they are not sufficient enough. "

"Infrastructure in Iraqi Kurdistan: Overview", 21/03/2013, online at: <u>http://www.marcopolis.net/infrastructure-in-iraqi-kurdistan-overview-2103.htm</u>

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#### Water shortage to be more acute in coming years'

Chairman, Agriculture and Water Council Muhammad Akram Khan Faridi, has said that in the next two years, Pakistan will have water short fall of over six million acre feet, which is equal to water stored in Mangla Dam. "The decline in water will continue to increase with every passing year and the biggest sufferer will be the province of Sindh, as Punjab has plenty of sweet sub soil water to meet its needs by sinking tube wells for irrigation purposes, he added."

Talking about the future water needs of the country, he said "it is the Sindh province which needs Kalabagh and other mega dams for its agriculture sector and sustained development more than Punjab and other provinces. He said Pakistan is the only country that has not built a dam in 34 years. "If we take a decision right now to go ahead with the construction of a dam to be completed by the year 2015 the water shortage will go up to 8 million to 10 million acre-feet."

He stressed that the feasibility study of Kalabagh Dam was prepared in several years after spending millions of rupees, and lot of preliminary work has already been done on the project. The Kalabagh Dam has become an absolute necessity for the country and delaying or abandoning its construction would be an invitation to disaster. He called upon President Asif Ali Zardari to allay fears of opponents of KBD and start work on the dam in greater interest of Sindh province and the country.

He said the depleting capacity of the existing water reservoirs call for at least one dam like Kalabagh, Bhasha or Bunji every 10 years. We have been neglecting this dire requirement and did not construct any new dam during the last 30 years and the country is today suffering for this criminal neglect in the form of drought and acute water shortage throughout the country specially Sindh and Balochistan.

Faridi said the water shortage in provinces will be much more acute in the coming years and this disaster can be averted only by undertaking construction of new dams on war-footing as big dams take a long-time for building. He said Turkey has built 40 dams on the Tigris River and other rivers over the last five decades, while Pakistan, during the same period, has built only two. Mangla Dam on the River of Jhelum (completed in 1968) and Tarbela Dam on the River Indus (completed in 1974).

"Water shortage to be more acute in coming years", 21/03/2013, online at: <u>http://www.brecorder.com/agriculture-a-allied/183/1166004/</u>

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#### Syria refugees draining Jordan water supply: Aid groups

Hundreds of thousands of Syrian refugees in Jordan are stretching the kingdom's meagre water resources "to the limit," two British aid agencies warned on Friday, calling for international help.

"The Syrian refugee emergency is highlighting one of Jordan's most pressing problems -- water," said Christian Snoad of Oxfam, in a joint statement with the British Red Cross.

"Solutions need to be found to deal with Jordan's water scarcity and this will need to be done as a matter of urgency.

"The Jordanian government will need... large-scale help from governments around the world to address this critical issue," said Snoad.

Jordan has taken in waves of Palestinian and Iraqis refugees who fled conflicts over the past few decades, and now hosts more than 450,000 Syrians, including 120,000 in the sprawling northern border camp of Zaatari alone.

The desert kingdom's "water supply system, already under severe strain, is being stretched to the limit by the large influx of refugees fleeing conflict in Syria," the statement said.

Faced with chronic water shortages, Jordan, whose own population has been growing at an annual rate of 3.5 percent, has been forced to extract more water from the ground since the mid-1980s.

More than 3,500 cubic metres of water are delivered each day into Zaatari, providing refugees with clean water for drinking, cooking and cleaning, said the statement.

"It's just a matter of time before the main sources run out. In some areas, groundwater extraction is nearly three times the recharge rate," it added.

Syrian refugees could afford to buy filtered water in Jordan, one of the world's 10 driest countries, where desert covers 92 percent of its territory.

"They have reported an increase in diarrhoeal cases among their young children who have no choice but to drink water straight from the tap, when it flows," said the joint statement.



"For its programme in Zaatari, Oxfam has adopted water-conservation measures such as taps that run water for short periods of time to prevent water wastage.

"Agencies have also called for the need to create better awareness among the refugee arrivals of Jordan's water problems."

Years of below-average rainfall have created a shortfall of 500 million cubic metres (17.5 billion cubic feet) a year, and the country forecasts it will need 1.6 billion cubic metres of water a year by 2015.

"Syria refugees draining Jordan water supply: Aid groups", 22/03/2013, online at: <u>http://english.ahram.org.eg/NewsContent/2/8/67467/World/Region/Syria-refugees-draining-Jordan-water-supply-Aid-gr.aspx</u>

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#### \* Approaching Summer and Syrian Refugee Influx Adding to Jordan's Water Worries

Just a short distance from Zaatari, Jordan's sprawling refugee camp, which officially hosts more than 160,000 people who've fled conflict in Syria, lies a road full of small nurseries growing vegetables and olive trees.

One of them is run by Khaled. But these days he's not at all happy. "There are problems every day," he says, shaking his head gloomily. Apart from his concerns about worsening security at Zaatari camp, whose lines of white tents you can easily spot from his rows of greenhouses and olive trees, one of his main concerns is the shortage of water and the extra strains that the large number of refugees could mean for water availability in the future.

Over three and a half thousand cubic metres of water each day is delivered into the camp at Zaatari, providing the growing numbers of refugees with clean water for drinking, cooking and cleaning. Oxfam is working in the camp, installing water and sanitation facilities for more than 14,000 people.

It's placing a huge strain on Jordan, which is ranked as one of the most water-stressed countries in the world, well before the recent flood of refugee arrivals.

Faced with chronic water shortages, the authorities in Jordan, whose own population has been growing at an annual rate of 3.5 percent, have been forced to extract more water from the ground since the mid 1980's. It's just a matter of time before the main sources run out. In some areas, groundwater extraction is nearly three times the recharge rate.

In Mafraq governorate, whose population has swollen to twice its size because of the refugee arrivals, and where Zaatari camp is located, problems have already begun appearing. Most households in northern Jordan are connected to piped water which is topped up through water trucking.

The water system is old and creaking; and it is estimated that as much as 50 percent of water in the governorate is lost through leaks in the water network or by people illegally siphoning water from the system.



In the summer, demands for water surge as temperatures soar and the population increases with tourist visitors and returnee Jordanians coming home to visit their families.

But as early as last month, there were signs of bigger problems to come. For two weeks in February, part of Mafraq town didn't have any water deliveries for two weeks, due to water shortages.

Local people say the refugee influx is making the water supply problem worse than normal. At one meeting, a host community told Oxfam staff that before the Syrian crisis erupted, water used to be delivered twice a week; now, they said, most areas only got water delivered once a week. The costs of getting water are also increasing. With greater numbers of users and higher water consumption, households are finding the water pipes are running dry more quickly and are having to purchase more water from the tankers -- which incurs extra costs.

Most families also pay out extra for filtered water to drink, complaining that the tap water is not good enough for drinking.

But many Syrian families, who arrived with little more than a pocketful of money and the clothes on their back, can't afford to do this; and they've reported an increase in diarrhoeal cases among their young children who have no choice but to drink straight from the tap.

Jordan's water woes are likely to get worse. First, the government is considering scrapping subsidies for fuel and electricity, making it likely the cost of water will soon go up. Some of the country's well fields lie several hundred metres below sea level; and most lie at least 200 metres below ground level. In either case, water has to be pumped out from the ground via generators.

The monthly electricity bill costs the Yarmouk Water Company, which provides water to four governorates in northern Jordan, around 1.2 million JD each month (£1.1m); but the real (unsubsided) cost is more than three times higher.

Back at his nursery, Khaled tells me that he's had to destroy hundreds of olive trees and some of his saplings, because the cost of keeping them alive and watered is higher than the costs he can recoup selling his crops.



"Right now, it costs around 300 JD a day 300 JD (£279) to keep the heaters on in my greenhouses," he tells me. "It's just too expensive."

As summer approaches, the likelihood is that temperatures and tempers are set to soar, while the country's water tables and wells continue to diminish.

"Approaching Summer and Syrian Refugee Influx Adding to Jordan's Water Worries", 22/03/2013, online at: http://www.huffingtonpost.com/caroline-gluck/approaching-summer-and-sy\_b\_2929699.html

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#### **\*** Rising global conflict over water calls for more cooperation

Past societies have battled bitterly over power, ideology and access to resources. Wars of the 20th century were fought over oil, but some scholars believe the 21st century's wars will be sparked by a different resource — water.

'Water wars' conjures up images of deserts and unstable governments. Water conflict is for the Nile and the Jordan rivers, and certainly not for the U.S. If disputes do arise, they happen along the Colorado River in the Wild West, where water is scarce.

Think again. Alabama, Florida and Georgia have been locked in a legal war since 1990, with temporary agreements failing constantly. In 2007, water scarcity became so dire that the governor of Georgia led a statewide prayer for rain.

North Carolina is not off the hook; our state has been in conflict over this resource with Virginia, South Carolina and Tennessee.

In response to global water disputes and the need for greater collaboration, the United Nations declared 2013 the International Year of Water Cooperation. Celebrations culminate on World Water Day, which is held annually on March 22, to focus attention on the importance of sustainable freshwater management.

UNC recognizes the global need for water cooperation on this World Water Day. Along with theUNC Water Theme, the FedEx Global Education Center is hosting a multifaceted exhibition, "The Water of Life: Artistic Expressions."

The exhibit opened Thursday with a reception for first-year student and painter Caroline Orr and Hanes Visiting Artist Bright Ugochukwu Eke. The evening also featured a multimedia performance by composer Allen Anderson and photographer and musician Brooks de Wetter-Smith.

Eke articulates ideas about human attitudes toward nature through installation art. His work in the FedEx Center focuses on the historical dimension of water, suggesting that slavery is an issue that cannot be forgotten when discussing water.



"It is through this art that I can raise awareness," Eke said, "and get people to start discussion on how to ameliorate the situation."

De Wetter-Smith hopes the program will transfer existing knowledge into a commitment to provide water for all. "We tend to take for granted whatever we do not believe to be a threat to our current lives," he said.

Orr's series tells the story of those whose lives are deeply impacted by the water crisis. The work puts a face behind the facts and figures of the global water crisis, telling the personal stories that are all too often glossed over.

Orr's artwork will be on display through July and auctioned online to benefit a water infrastructure project run by the student group A Drink For Tomorrow. Orr's work communicates a message to the UNC community and assists in the provision of water to a community in Peru. UNC's focus on water has produced much academic talk and research, which is critical for assuaging

the crisis. However, we all absorb information differently, so this exhibits portrays water differently through imagery, sound, texture and personal stories.

In an era of growing conflict over water, cooperation and communication are more important than ever. Art is a universal language, and perhaps the best way to start.

"Rising global conflict over water calls for more cooperation", 22/03/2013, online at: http://www.dailytarheel.com/article/2013/03/world-water-day

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## The Looming Threat of Water Scarcity

Some 1.2 billion people—almost a fifth of the world—live in areas of physical water scarcity, while another 1.6 billion face what can be called economic water shortage. The situation is only expected to worsen as population growth, climate change, investment and management shortfalls, and inefficient use of existing resources restrict the amount of water available to people. It is estimated that by 2025, 1.8 billion people will live in countries or regions with absolute water scarcity, with almost half of the world living in conditions of water stress.

Water scarcity has several definitions. Physical scarcity occurs when there is not enough water to meet demand; its symptoms include severe environmental degradation, declining groundwater, and unequal water distribution. Economic water scarcity occurs when there is a lack of investment and proper management to meet the demand of people who do not have the financial means to use existing water sources; the symptoms in this case normally include poor infrastructure.Large parts of Africa suffer from economic water scarcity.

World population is predicted to grow from 7 billion to 9.1 billion by 2050, putting a strain on water resources to meet increased food, energy, and industrial demands. But there are many other pressures, including increased urbanization and overconsumption, lack of proper management, and the looming threat of climate change. According to the United Nations Food and Agriculture Organization and UN Water, global water use has been growing at more than twice the rate of population increase in the last century.

At the global level, 70 percent of water withdrawals are for the agricultural sector, 11 percent are to meet municipal demands, and 19 percent are for industrial needs. These numbers, however, are distorted by the few countries that have very high water withdrawals, such as China, India, and the United States.

Agricultural water withdrawal accounts for 44 percent of total water withdrawal among members of the Organisation for Economic Co-operation and Development (OECD), but this rises to more than 60 percent within the eight OECD countries that rely heavily on irrigated agriculture. In the four transitional economies of Brazil, Russia, India, and China, agriculture accounts for 74 percent of water withdrawals, but this ranges from 20 percent in Russia to 87 percent in India.



Policymakers must introduce a variety of measures to address global water scarcity. One important initiative is to support small-scale farmers. Much of the public investment in agricultural water management has focused on large-scale irrigation systems. Farmers can also use water more efficiently by taking a number of steps, including growing a diverse array of crops suited to local conditions and adopting irrigation systems like "drip" lines that deliver water directly to plants' roots.

Climate change will affect global water resources at varying levels. Reductions in river runoff and aquifer recharge are expected in the Mediterranean basin and in the semiarid areas of the Americas, Australia, and southern Africa, affecting water availability in regions that are already water-stressed. In Asia, the large areas of irrigated land that rely on snowmelt and high mountain glaciers for water will be affected by changes in runoff patterns, while highly populated deltas are at risk from a combination of reduced inflows, increased salinity, and rising sea levels. And rising temperatures will translate into increased crop water demand everywhere.

To combat the effects of climate change, efforts must be made to follow an integrated water resource management approach on a global scale. This involves water management that recognizes the holistic nature of the water cycle and the importance of managing trade-offs within it, that emphasizes the importance of effective institutions, and that is inherently adaptive.

"The Looming Threat of Water Scarcity", Supriya Kumar, 22/03/2013, online at: http://blogs.worldwatch.org/nourishingtheplanet/the-looming-threat-of-water-scarcity/

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#### Long lasting change is about good governance and national ownership

On World Water Day, the minister of water resources in Sierra Leone shares his thoughts on meeting ambitious targets

As the newly appointed minister of <u>water</u> resources in <u>Sierra Leone</u>, I am acutely aware that we are at the start of a long journey towards achieving our <u>national policy targets for water and</u> <u>sanitation</u> (pdf). The policy contains the ambitious targets of extending national water supply and<u>sanitation</u> coverage to 74% and 66% respectively. This represents a significant increase in the annual rate of WASH (water, sanitation and hygiene) service delivery. The policy also has laudable ambitions to ensure sound stewardship of national water resources, as well as strengthening government institutions to perform more effectively. For a new ministry, the burning questions are where should we focus our attention and what are our priorities?

On the important issue of water resources management (WRM), this means we should focus on the four fundamental basic steps. This is important because there is limited national capacity – in terms of expertise, finances and material resources.

First, we cannot manage water resources if we neglect to monitor some important hydrological parameters, such as rainfall, groundwater and surface water levels, water abstraction and changes in land use. Second, raw data collection and the results of our analysis need to inform water resources management practices. This requires effective rules and regulations to be in place, with clearly defined roles and responsibilities across multiple organisations and at various levels. Next, we need to ensure continued improvements in the water supply infrastructure, with an emphasis on keeping water supply services working. Finally, we need a holistic approach that recognises the other health and economic benefits that come from sound stewardship of water and land resources.

Though these four actions are fundamental and rudimentary, there are many interrelated reasons why the achievement of sound water resources management poses such a challenge for fragile states such as Sierra Leone. Countries like ours, for example, are often presented with a "one size fits all" blueprint for water-resources management that fails to recognise national capacity. This can inadvertently lead to inactivity because generic Integrated Water Resources Management(IWRM) approaches can be overwhelming for government staff. The project being undertaken in Sierra Leone



– <u>a three-year programme</u>supported by the UK's <u>Department for International Development (DfID)</u> – involves several local stakeholders who all have different concerns about quantity and quality of water resources as the basis for supply, or as the recipient of discharges. The most challenging discussions will be had within the Rokel-Seli river catchment, either upstream or downstream of the <u>Bumbuna dam</u>.

As a result, we have decided to focus the project initially in this area. The Rokel-Seli catchment represents a microcosm of Sierra Leone's water resources management issues, and a localised approach ensures that government institutions are not overwhelmed. The project also aims to establish effective water resource monitoring and data collection as a basis for decision-making. To do this, we are setting up institutional arrangements for data collection, storage and publication; and for dialogue and decision-making among stakeholders with a wide range of diverse interests in water security.

Despite growing recognition of the impact of climate change on WRM, it remains another important challenge that needs to be addressed at the local and national level, if the project is to be effective and have a long-lasting impact. Policymakers and water sector professionals need to better acknowledge the potential for monitoring and managing water resources at a local or community level. In particular, traditional water management practices need to be recognised and used as a foundation for the development of future water management strategies.

This new way of working, I believe, will lead us on a progressive and deliberate shift away from the shortcomings of the past. Three main principles guide this change process: The first is the promotion and establishment of hydrological monitoring and a repository for analysed data. Water resources cannot be managed if they are not monitored. The second is the development of WRM activities at the local level, that are practical in nature and strengthen national capacity in an incremental manner. Third is the enforcement of new water resources legislation. And progress has been good: fieldwork accomplished so far has seen the establishment of groundwater monitoring, the installation of rain gauges, with roles and responsibilities for water resources monitoring and management being clearly defined. A new water resources bill has also been drafted following widespread national consultation.

It is difficult to predict future impacts on water resources, but I have little doubt that we must focus on these priority areas and continue to work hard to increase the capacity of government institutions



to manage water resources at transboundary, national and local levels. In this regard we are grateful for DfID's technical, institutional and financial support. It lays the foundations for establishing water resource management activities in Sierra Leone. It will assist in enacting national water resources legislation, as well as supporting the creation of a WRM agency with regulatory functions. It is intended to offer education and guidance to stakeholders whose activities impact on surface water and groundwater resources. Furthermore, it recognises that national ownership lays the foundations for strong and clear <u>leadership</u>.

Collaboration and co-operation with DfID and our other development partners is vitally important, but getting meaningful and long-lasting change is about good governance and national ownership. I am committed to seeing that through towards the achievement of our national water and sanitation policy targets.

"Long lasting change is about good governance and national ownership", 22/03/2013, online at:

http://www.guardian.co.uk/global-development-professionals-network/2013/mar/22/momodu-maligi-water-resourcessierra-leone

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#### \* World Water Day 2013: How Shortages Affect Women, Kids, Hunger (And What You

#### Can Do)

The global water crisis isn't just about simple supply and demand -- it's an issue related to women's rights, global development and preventable deaths.

As the world population swells to over 7 billion people, and the demand for fresh water continues to grow with it, global leaders have called for greater innovation, advocacy and solutions, which is why this year's <u>World Water Day has been dedicated to the theme of "cooperation</u>."

<u>UN Deputy Chief Jan Eliasson</u> said improving access to water would reduce maternal health issues, child mortality and overall poverty, the AP reported.

"If we do water and sanitation right, we can have a great improvement on other goals," he said.

As climate change and political and social unrest take their toll on fresh water supplies, 783 million people lack access to clean or relatively safe water and 37 percent of the world's population doesn't have access to toilets, <u>a fact that the UN points to as a further inequity</u>.

"Access to sanitation facilities around the world, more than any other service, provides a window into the vast difference between the 'haves' and the 'have-nots."<u>Catarina de Albuquerque, UN Special</u> <u>Rapporteur on the human right to safe drinking water and sanitation</u>, said in a press release. Read on to find out how the water crisis affects women, children, education, health and hunger -- and what's being done about it.

#### THE WATER CRISIS IS A WOMEN'S ISSUE

In Africa alone, <u>women and children spend 40 billion hours</u> annually collecting water. While taking on this backbreaking effort, they're also subjected to harassment and sexual assault along the way in unprotected areas.

#### THE WATER CRISIS IS A HUNGER ISSUE

Water scarcity could cause major food shortages in the foreseeable future, experts have warned. Earlier this year, <u>Nestle CEO Paul Bulcke said we're using more than our sustainable supply</u> and that this overuse of fresh water is a serious risk, The Guardian reported:



"It is anticipated that there will be up to 30 percent shortfalls in global cereal production by 2030 due to water scarcity," he said. "This is a loss equivalent to the entire grain crops of India and the United States combined."

## THE WATER CRISIS IS A CHILD MORTALITY ISSUE

Diarrhea is the second biggest killer of kids globally -- an issue that is completely preventable. Lack of clean water is the primary reason why more than 3,000 children under <u>5 years of age die every day</u> <u>from diarrhea and other water-related illnesses</u>, the UN reports.

#### THE WATER CRISIS IS A SANITATION ISSUE

One in three people don't have a toilet, the UN reports. What's more, infrastructure issues are lagging in progress. "Access to sanitation currently ranks as the most-off track of the <u>Millennium Goals, and</u> <u>one that will obviously not be met by 2015</u>," Catarina de Albuquerque, UN Special Rapporteur on the human right to safe drinking water and sanitation, said in a press release.

#### THE WATER CRISIS IS AN EDUCATION ISSUE

Menstruation should just be an inconvenience, not a reason to miss <u>10 to 20 percent of the school</u> <u>year</u>. But for girls who go to schools that don't have gender-specific bathroom facilities, that's the unfortunate reality. Building sanitary latrines allows girls to go to school when they have their periods, without worrying about hygiene issues and continue to increase literacy rates for young females in developing countries.

World Water Day 2013: How Shortages Affect Women, Kids, Hunger (And What You Can Do), 22/03/2013, online at: http://www.huffingtonpost.com/2013/03/22/world-water-day-2013-facts n 2927389.html?ncid=edlinkusaolp00000003

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#### Millions won't be celebrating World Water Day

Half of humans lack safe drinking water, while competition for water from agriculture and industry could put more people at risk in years to come, says a Portuguese lawyer who is the United Nations' independent advocate for the right to water.

Catarina de Albuquerque, speaking ahead of World Water Day on Friday (22 March), said the official UN figure - 800 million – doesn't provide a full picture of water poverty, estimating that some 3.5 billion people lack a safe supply.

"We know that not everybody who is getting water gets safe water," de Albuquerque, the UN's special rapporteur for the rights to water and sanitation, said by telephone from Lisbon.

"Many of the people I've met on fact-finding missions who have taps inside their houses, or who have wells next to their houses ... much of this water is contaminated with human waste, because of industry, pesticide runoff, etc.," she said when asked about the UN statistics. "So the figures are even worse than the ones that you mentioned."

EU: The main donor

The European Union is the biggest funder of water and sanitation works in developing countries, providing an estimated  $\in 1.5$  billion annually, and Brussels is calling for further support for water and sanitary toilets in global talks on a future anti-poverty framework.

A grassroots effort to declare water a fundamental right in Europe and exempt water supply and management from European Commission liberalisation policies recently became the first European Citizen Initiative to reach 1 million signatures.

De Albuquerque and six other UN rights advocates are also calling for governments to be cautious about using the market to deliver water.



The UN General Assembly recognised the right to water as a fundamental human right in 2010, giving ammunition for court challenges and international pressure.

"Increasingly, water is subject to allocation through market mechanisms, with the risk that the poor will be priced out," the UN advocates said in a World Water Day statement.

"It is crucial to ensure cooperation between the competing users of water, to ensure that the human rights of all are realised and also that the most marginalised and vulnerable are not negatively affected by unequal resource allocation at every turn, by every decision on water resource allocation," the statement said.

#### MDG shortfall

Improving water and sanitation access formed one of the UN Millennium Development Goals, or MDGs, which end in 2015. Despite steady improvements in water availability since 2000, the results from the UN paint a mixed picture:

Some 2.5 billion people have no sanitation facilities, with open defecation elevating the risk of disease and groundwater contamination;

Access to latrines changed little between 1990 and 2010 in sub-Saharan Africa and only marginally in South Asia, the world's poorest regions;

Of the 800 million living in water poverty, 40% are in sub-Saharan Africa;

Across sub-Saharan Africa, 61% of people have a ready access to water but only 30% have latrines, the lowest rates in the world.

"Obviously there has been progress, but I don't see World Water Day is a day to celebrate," de Albuquerque told EurActiv. "It's more a day that forces us to think about much more we need to do."

"It's also an opportunity to influence the post-MDGs," she said, adding that the future anti-poverty framework should "eliminate inequalities."

Heavy burden on economy



Ellen Johnson Sirleaf, the Nobel Prize-winning president of Liberia, recently told a gathering that included EU and UN officials that bad water and sanitation take a heavy economic toll, breeding both disease and poverty.

The former bank executive and World Bank official estimated the global cost of poor water and sanitation in developing countries at \$260 billion.

"All too often access to adequate sanitation in particular is seen as an outcome of development, rather than a driver of economic development and poverty reduction. South Korea, Malaysia and Singapore in the 1960s and 1970s demonstrated the potential for boosting economic development by addressing sanitation," Sirleaf said in Monrovia at a UN meeting on the future of the MDGs.

## **POSITIONS:**

"The great majority of the water we use – and which we often waste – is not for drinking, showering or brushing our teeth," said Guido Barilla, president of the Barilla Center for Food and Nutrition, which is releasing a book on World Water Day, 'The water we eat. Virtual water: what it is and how we consume it'. "It goes towards all the stages of a product lifecycle, and above all towards the food we eat. It follows from this that eating habits can have a significant impact on the availability of water resources."

Several UN rights experts commented on World Water Day, according to a statement issued by the UN's Office of the High Commissioner for Human Rights.

UN Special Rapporteur on human rights and extreme poverty, Magdalena Sepúlveda, said: "Persons living in poverty are disproportionately affected by limited access to water and are often forced to inhabit areas in which access to water is restricted owing to cost, lack of infrastructure, denial of services to persons without secure tenure, poor resource management, contamination or climate change. Access to clean water is key to reducing many aspects of poverty and States must take measures to ensure that persons living in poverty are not charged higher rates for water services owing to consumption levels."



John Knox, the UN Independent Expert on human rights and the environment, said: "Improved water resources and wastewater management are key to ensuring a safe and healthy environment. Overexploitation of many of the surface water resources and great aquifers upon which irrigated agriculture and domestic supplies depend has resulted in more and more countries facing water stress or scarcity. Within those countries, it will be those living in remote areas, the marginalised and vulnerable who are most negatively affected by this water scarcity."

The UN Special Rapporteur on the right to health, Anand Grover, said: "Safe water and adequate sanitation are key underlying determinants of health. We have seen too often when inadequate access to water and sanitation has undermined the realisation of the right to health by threatening life, devastating health, eroding human dignity and causing deprivation. International cooperation is essential to improve water supply, manage water resources and treat waste-water. Better water management, including the protection of water ecosystems, through enhanced cooperation between all stakeholders is also crucial in preventing, controlling and reducing water-related diseases. These are indispensable steps to ensure the human right to health for everyone everywhere."

Alfred de Zayas, the UN Independent Expert on the promotion of an equitable and democratic international order, said: "With the growth of the world population, the global climate change and the need for a greater healthy environment, access to water resources has become a crucial condition for the realisation of an equitable international order, where the needs of the peoples are effectively addressed. In this regard, the need for international cooperation, including in joint effort with relevant non-state actors, is paramount to ensure water is made available to all without discrimination. Water is a human right, an enabling right, not a mere commodity."

The UN Special Rapporteur on the right to food, Olivier de Schutter, said: "Freshwater resources are essential for agriculture to sustain the world population with adequate and nutritious food. However, while 70% of all water resources are used for agriculture, all too often this precious and frequently limited resource is not equally shared between all those who need it, but is rather distributed according to who can afford to pay the most, or who owns the land under which it is located."



#### WATER RESEARCH PROGRAMME -Weekly Bulletin-

In a joint statement, Kamala Chandrakirana, chair-rapporteur of the UN working group on discrimination against women in law and in practice, and the special rapporteur on violence against women, Rashida Manjoo, said: "States must pay attention to the gender dimensions of water supply and distribution since women are intrinsically linked to water resources because of their roles and responsibilities in using and managing water, in particular in rural areas."

"Since women and girls often cook, clean, farm, and provide health care and hygiene for their households," the statement said, "they are on the front lines of their communities' water issues. They often have to travel considerable distances to collect water, facing an enhanced risk of sexual and other forms of violence. Women's voices must be heard at local, national and international levels if global equity is to prevail in the water-scarce world we are living in."

"Millions won't be celebrating World Water Day", 21/03/2013, online at: http://www.euractiv.com/sustainability/millions-won-celebrating-world-w-news-518658

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## **World Water Day 2013: Water as a Catalyst for Peace**

Editor's Note: For World Water Day 2013, and in partnership with <u>Circle of Blue</u>, we asked some of the world's leading experts and innovators working on issues of water scarcity, security and cooperation to weigh in, offer solutions, and help us better understand key challenges and opportunities moving forward. This debate will also inform an upcoming session at this year's <u>Skoll</u> <u>World Forum</u> in Oxford, UK, on exactly this topic.

Sylvia Lee leads the water program at the Skoll Global Threats Fund.

Today we celebrate World Water Day – a day to raise awareness on the global water challenge and to advocate for the sustainable management of water resources. The United Nations has declared 2013 as the International Year for Cooperation on Water, recognizing that "water is a shared resource and its management needs to take into account a wide variety of conflicting interests."

The challenges of the growing global water crisis are well documented. As population increases and as our economies get wealthier, the demand for water increases. McKinsey estimated that by 2030, there will be a 40% gap between global water supply and demand. And climate change has already started to profoundly impact the availability, distribution, and quality of water.

The impact of water challenges as a risk to national, regional and global peace and security, however, is perhaps less well understood. More than 260 river basins and 265 aquifers, home to over 40 percent of the world's population, are shared by two or more countries. If water resources continue to be poorly managed, food and energy production will decline, and waterborne disease will increase. When combined with poverty, social tensions, and weak leadership and institutions, water challenges may lead to social disruptions that cause state instability and regional tension. As United Nations Secretary General, <u>Ban Ki-Moon</u>, said, "Water scarcity threatens economic and social gains.... And it is a potent fuel for wars and conflict."

Last year, a National Intelligence Council study commissioned by the former Secretary of State, <u>Hillary Clinton</u>, stated "During the next 10 years, many countries important to the United States will experience water problems—shortages, poor water quality, or floods—that will risk instability and state failure and increase regional tensions." Examples of these tensions are already



evident between states such as Ethiopia and Egypt, India and Pakistan, and Tajikistan and Uzbekistan, and China and its Mekong neighbors. In each of these cases, an upstream country plans to build large dams to develop hydropower and irrigation systems, which will likely have significant negative impacts on the downstream neighbor.

Some of the biggest challenges of water insecurity, however, are conflicts over water within a country. The United Nations suggested that the Darfur conflict began in part because of a water crisis. The new US Secretary of State, John Kerry, made a similar observation, "Developing water capacity for people in some parts of the world keeps people from killing each other. It keeps tribes from going out and disintegrating and creating a failed state. I've seen that. I've been in Sudan, South Sudan, where today people are fighting over water."

Increasing competition over water resources is also leading to conflicts between the private sector, agriculture water users, and civil society. Private sector companies <u>PepsiCo</u> and The <u>Coca-</u> <u>Cola</u> Company have been accused of stealing millions of litres of water and denying local communities and farmers their fundamental right to water in India. While these accusations are still being sorted in traditional courts and the court of public opinion, it is clear that these types of conflicts will likely continue as available water resources decline.

The news is not all dire. Historically, water has acted as a catalyst for peace. In fact, studies by experts have found that countries are more likely to cooperate over water than to fight over water. The Indus Water Treaty has withstood the test of two wars between India and Pakistan. During the Vietnam War, countries in the Mekong River basin still continued technical negotiations. After independence, nine countries in the Niger River Basin in Africa created a joint river basin authority to cooperatively manage their joint water resources. In fact, over 3,600 water-related treaties have been signed in the past 1200 years.

The role to promote and improve water cooperation is not only confined to governments. Skoll Award for Social Entrepreneur, <u>Friends of the Earth Middle East/Ecopeace</u>, is a unique organization that brings together Jordanian, Palestinian and Israeli environmentalists to promote cooperative efforts to protect the Jordan River Basin and the Mountain Aquifer in the West Bank. <u>IUCN's</u> <u>Ecosystems for life</u> project bring together scientists from India and Bangladesh to do joint research



projects across boundaries. The private sector has been actively engaged in various discussions and joint initiatives such as the <u>CEO Water Mandate</u>, the <u>Alliance for Water Stewardship</u>, and the <u>World</u> <u>Business Council for Sustainable Development</u>to develop a set of guidelines for the private sector to engage in water and define "good water stewardship".

Since water is a common property resource, no one owns the problem and no one owns the solution. To tackle one of the biggest challenges we face in the 21<sup>st</sup> century, we need to continue to find innovative ways to cooperate and work together to provide water security for all.

"World Water Day 2013: Water as a Catalyst for Peace", 22/03/2013, online at: http://www.forbes.com/sites/skollworldforum/2013/03/22/world-water-day-2013-water-as-a-catalyst-for-peace/

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## ✤ U.N. chief warns of growing water scarcity

UNITED NATIONS (AP) - U.N. Secretary-General Ban Ki-moon warned that by 2030, nearly half the world's population could be facing a scarcity of water, with demand outstripping supply by 40%.

One in three people already live in a country with moderate to high water stress, Ban told a U.N. event marking the opening of the International Year of Water Cooperation 2013. It also marked the 20th anniversary of the proclamation of World Water Day.

"Competition is growing among farmers and herders; industry and agriculture; town and country; upstream and downstream; and across borders," the secretary-general said.

Ban said international cooperation is essential "to protect and manage this fragile, finite resource," especially as the world population grows and the climate changes.

And with more people moving to urban areas, water use is projected to increase by 50% by 2025, said Ambassador Thomas Mayr-Harting, head of the European Union delegation to the United Nations.

By that time, he said, roughly 5.5 billion people - two-thirds of the projected global population - "will live in areas facing moderate to severe water stress."

Mayr-Harting said the U.N. Millennium Development Goal of cutting in half the proportion of people without access to clean water by 2015 is likely to be surpassed.

But he said "over 780 million people today do not have access to improved sources of drinking water, especially in Africa, and major inequities remain."

"U.N. chief warns of growing water scarcity", 22/03/2013, online at: http://www.mydesert.com/usatoday/article/2012259

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#### Desperate quest for water in Middle East

Experts say much of problem lies in bad water management and lack of cooperation

Istanbul: Parts of Jordan receive running water just once a week, for 24 hours. In summer months, the number of hours could be halved. In war-torn Syria, the affluent rent rooms in the few hotels that remain open to have showers due to a shortage of water supply. And in the West Bank, Palestinians under occupation face similar water shortages while Israeli colonists swim in their backyard pools.

The Middle East is one of the driest regions in the world. Jordan, a state that is poor in most resources, faces a demand for water that vastly outstrips supply. Compounding to that is the not only a fast growing population but also the influx of refugees the country has witnessed in the past decade – first from the war in Iraq and then from the Syrian civil war.

While conflict and politics play a significant role in the water shortage that the Middle East faces, experts say much of the problem lies in bad water management and lack of cooperation between countries. Many of the rivers and aquifers that supply freshwater to the region's countries transcend borders, but few agreements exist between countries on how the resource should be shared.

It is however the very terminology of sharing that experts believe should be done away with for real cooperation to take place. Sharing, a term that denotes division, should be replaced with management, and ownership of water should be replaced with universal rights.

A study by India-based think tank Strategic Foresight has laid out options for Middle Eastern states to cooperate to ensure that their shared water resources are distributed equitably, but also in ways to find new sources of water and reverse the depletion of their sources of water. In its report, Blue Peace, the group brought together experts and journalists in Istanbul to discuss ways to promote a cooperation mindset among the region's states.

One such solution is a Dead Sea-Red Sea Canal, which would connect the two seas through a pipeline to give a lifeline to the Dead Sea that may otherwise disappear in the next 50 years. The Red Sea would flood the Dead Sea with water while generating hydro-electricity as the Red Sea's water drops 400m to the lowest point on earth into the Dead Sea. The project is said to benefit Jordan, the Israelis and the Palestinians.



Hurdles are plenty, however, some of which include the politicization of water. Jordanian officials say for example that the agreements signed with neighbouring states, particularly Israel, are unfair and should be reviewed. Syrian officials say neighbouring countries closely guard information on the usage of water from shared sources, considering it a matter of sovereignty. Iraqis blame Turkey for not entertaining their concerns about water because it is politically at odds with their government.

An ambassador from a south Asian country in a neighbouring country said that as his government was about to conclude a water management agreement with the neighbouring country, information was released in the media that the neighbouring country was in fact stealing water from his government. The news proved to be false and was believed to be disseminated by the intelligence agency in a third, neighbouring country, said he ambassador.

Similarly, Israel's superior military capabilities have allowed it to force its neighbours into accepting a status quo which sees Israel take the bulk of the water from shared rivers.

Mahmoud Labadi, a senior advisor to the ruling Palestinian faction Fatah, said it was futile to discuss cooperation in trans-boundary water resources when states like Israel did not recognize boundaries of lands Palestinians lived on, and controlled more than 80 per cent of the West Bank's water resources. "We fail to talk about the stealing of water from the Palestinians, and the fact that Palestinians have to pay Israel for the water that is taken from their own aquifers. Water is a human right issue, and we are totally dependent on the occupier for this".

He said that Israel had in the past suggested providing the Palestinians with desalinated water during negotiations, but rejected the idea as it would involve waving Palestinians' right to water they see as belonging to them.

Mohammad Abu Zaid, president of the World Water Council, however argued that Israel should be given solutions by the Arab states for its own water needs as well as those of the Palestinians, suggesting that only when it is confident about its own water security will it stop taking its neighbours' resources.

He said that while he understood the rejection of the offer for desalinated water, it may be one of the few remaining options. "We can't afford another war".

#### DESALINATION IS THE FUTURE



The growing populations of the northern Arab states and the rising demand of water is likely to cause severe shortages in the future that will inevitably lead them to turn to desalinating seawater.

Long seen as a feature of Gulf states, which have 60 per cent of the world's desalination capacity, the process may be moving towards states that had until recently relied largely on surface and groundwater to meet its domestic needs.

Long shunned by a number of states for the amount of energy it used, desalination was made possible in Gulf states due to the large energy resources available to them. Experts however believe that the falling cost of desalination coupled with the falling supply of water from renewable sources makes desalination more attractive to Middle Eastern states.

"Desalination opens endless possibilities... the cost of desalination has almost come down to that of treating wastewater, the product of which is not of such high quality," said Mohammad Abu Zaid, president of the Arab Water Council.

Experts believe that as technology develops, desalination may be able to do more than just allow states to become more self-sufficient in meeting their food and water demands, but be able to play a role in ending thirst in some of the most arid parts of the world. They point out that there could be a commercial utility in desalination that could work to end thirst through the sale of affordable water to these countries.

"Desperate quest for water in Middle East", 21/03/2013, online at: <u>http://gulfnews.com/news/region/jordan/desperate-quest-for-water-in-middle-east-1.1161350</u>

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## \* Potable water of Gaza is on verge of scarcity: UNICEF

## Mutu delivered a speech prior to a bicycle race event which was organized to mark World Water Day by Coastal Municipalities' Directorate of Waters.

UNICEF Representative to Gaza, Mior Mutu stated on Friday, sources of drinking water in Gaza was on the verge of scarcity.

Mutu delivered a speech prior to a bicycle race event which was organized to mark World Water Day by Coastal Municipalities' Directorate of Waters.

Mutu said, "90 percent of the water sources in Gaza are not potable. Access to drinking water needs to be prioritized by officials."

In the scope of raising awareness on lack of potable water sources in Gaza, a bicycle race was organized.

According to UN report which was published in 2012 there was a warning let off towards water issues in Gaza, in the case of the current situation's continuity, it was predicted that sources of drinking water would end by 2016.

"Potable water of Gaza is on verge of scarcity: UNICEF", 22/03/2013, online at: http://www.worldbulletin.net/?aType=haber&ArticleID=105139

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#### \* Israel Controls Renewable Water Resources, says Statistics Bureau

RAMALLAH, March 21, 2013 (WAFA) – Israel controls the renewable water resources, restricts access to it and imposes obstacles on the drilling of new water wells, Palestinian central bureau of statistics (PCBS) and the Palestinian water authority (PWA) said Thursday.

PCBC and PWA, in a press release issued on the occasion of the world water day March 22, 2013 presenting the key indicators related to water in Palestine, said that Israel controls the majority of renewable water resources totaling 750 MCM, while Palestinians receive only about 120 MCM.

They added that Israel is the one to be blamed for the shortage in water in Palestine, whereas 75 MCM of water supplied to the settlements, of which 44 MCM was obtained from wells controlled by Israel in the West Bank.

Moreover, Water is priced at 2.7 NIS per cubic meter in the West Bank and 2.4 NIS per cubic meter in the Gaza Strip, households not connected to water network pay higher prices, according to statistics.

Results from the 2011 survey showed that 91.8% of households in Palestine live in housing units connected to a water network; 89.4% in the West Bank and 96.3% in the Gaza Strip.

Households that are not connected to water networks rely on purchasing water tanks that are extremely expensive (24.4 NIS per cubic meter), and there is no guarantee of the water quality, said PCBC and PWA.

"Israel Controls Renewable Water Resources, says Statistics Bureau", 21/03/2013, online at: http://english.wafa.ps/index.php?action=detail&id=21930

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#### Israel controls most water in West Bank

Palestinians living under occupation are not able to access their own water, officials say

Ramallah: Israel controls 82 per cent of water resources in the Palestinian Territories and the available water left for Palestinians does not meet their daily household and agricultural needs, according to a senior Palestinian official.

Walid Assaf, the Palestinian Agricultural Minister, maintains that the Palestinian Territories urgently need water and that water is available in Palestine but the Israeli occupation prevents Palestinians from using it. "Israel fully controls water resources in Palestine and does not give Palestinians the opportunity to address their water needs," he told *Gulf News*.

Israel bans Palestinians from digging water wells, a process which needs several complicated Israeli permits and procedures.

Speaking to *Gulf News*, Palestinian water officials said the Israelis do not even agree to sit with their Palestinian counterparts to discuss the issue of water shortages in the Palestinian Territories and always tell representatives that the water available in the Palestinian Territories meets the daily needs of Palestinians.

Under the Oslo Accords, a joint Israeli-Palestinian committee had been set up to discuss the Palestinian water requirements. Palestinian officials claim that since the year 2000 this committee has not convened even once to address the water shortage in the Palestinian Territories. The official said they had repeatedly sought meetings with the Israelis to discuss the issue but the Israelis have been refusing, delaying and coming up with unacceptable reasons to avoid the meetings.

The Palestinian water officials stressed that the situation has become worse with the creation of the Israeli segregation barrier which annexed scores of water wells that had been given to the Palestinians after the Oslo Accords.

The Palestinian officials argued that the path of the barrier had been modified several times to gain control of as many water wells as possible, and that at least 100 wells have ended up behind the Israeli segregation barrier.

Palestinian farmers were left with no choice but to dig new water wells on their own and without even referring to the Israelis, but Israeli forces raided the concerned areas and destroyed the newly dug water wells.

Assaf said the Palestinian National Authority had been setting up recycling plants to use drainage water. Several plants have been set up in both the West Bank and Gaza Strip. "It is time however to pay bigger and real attention to the agricultural sector to achieve development," he said.



Ayman Al Rabi, the Chairman of Board of the Palestinian Environmental Organisations, said it was time for the PNA to suspend the already expired water agreement with the Israeli occupation. "The PNA should take advantage of its upgraded UN status to press Israel to sign new fairer water agreements which enable the Palestinians to possess water resources," he said.

He stressed that water transitional agreements with the Israelis have already expired and should no longer be in place.

Palestinian water officials have also seriously warned that the PNA could lose a huge amount of foreign aid, mainly provided by the EU, as Israel insists on denying Palestinians access to the water resources in the Palestinian Territories. The main area of concern is C Zone which is under full Israeli security and administrative control and constitutes 65 per cent of the total area of the West Bank.

"Israel controls most water in West Bank", 17/03/2013, online at: <u>http://gulfnews.com/news/region/palestinian-territories/israel-controls-most-water-in-west-bank-1.1159438</u>

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#### Israel denies Palestinians access to water

A large solidarity walk has been organized in the Jordan Valleys between Palestinian communities for World Water Day.

The walk was organized by the Freedom Theatre from Jenin alongside the Jordan Valley Solidarity Campaign group in order to bring awareness to the international community about Palestinian villagers and farmers who's water rights are denied by Israel's discriminatory practices and denying Palestinians water rights.

The activists hiked through Palestinian Bedouin villages including al Hadadya, where the Bedouin communities suffer sever water shortages alongside a water well in the illegal Israeli settlement

Ro'I, where the Israeli settlers benefit from up to 7X the amount of water than Palestinians.

Due to the Jordan Valleys being located in area C, which is under full Israeli administration, the Palestinian villagers are not granted permits to build water cisterns and are allocated 4X less water from the West Bank mountain than the Israelis. If they do build tanks to collect rain water they are often demolished by the Israeli army. This makes traditional life for the Bedouin's difficult as they have little water to maintain agriculture or feed their herds.

Although these events seem to be in juxtaposition with the Bedouin settings, it's the message they are sending out to the international communities that's the most important, including the sever water shortages suffered by the Bedoins.

"Israel denies Palestinians access to water", 23/03/2013, online at: <u>http://www.presstv.ir/detail/2013/03/23/294936/israel-denies-palestinians-access-to-water/</u>

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#### Exploring Jordan's historical waterways

This Saturday, I awoke early for a whirlwind tour of the Jordan River, Dead Sea and Ma'in Hot Springs.

I found that the bodies of water in Jordan are as spectacular as they are scarce. I departed from Amman that morning and arrived at the point on the River Jordan where Jesus Christ was most likely to have been baptized (according to Pope John Paul II and Pope Benedict XVI).

Although the group of students with whom I was travelling come from diverse backgrounds, the modern churches and extant archaeological features of the site afforded an opportunity for each of us to consider the immense religious, cultural and historical significance of the site in our own way. We were also able to wave at visitors in Israel just across the river. It was an unique experience interacting with the Israeli inhabitants near this historical waterway, and seeing their culture. It's no secret that the Jordan River has seen better days.

So, our visit also functioned as a firsthand case study of water policy in Jordan. In keeping with this idea, we spoke with an expert from a local environmental NGO (called Friends of the Earth Middle East) dedicated to rehabilitating the Jordan River.

He impressed upon us the legacy of regional hydrological mismanagement that has endangered the Jordan River (or as he insisted calling it, the Jordan "Creek").

Today, the Jordan flows at about 2 percent of its natural volume, which threatens not only its survival but that of the terminal lake downstream — the Dead Sea.

The diminished flows of the Jordan have left the Dead Sea thirsty. It is actually shrinking at a staggering rate of one meter per year.

There are a myriad of problems that accompany the Dead Sea's 'death', including the contamination or displacement of bordering freshwater aquifers and sinkholes in the land around the sea.

We topped off our tour with a visit to another of the Dead Sea's sources. This time, we were able to explore the Ma'in Hot Springs.

We bathed in the steaming mineral spring and stood beneath the assortment of both small and large waterfalls which cascaded and trickled into the hot pools in which we sat taking advantage of a rare opportunity to relax.

"Exploring Jordan's historical waterways", 21703/2013, online at: http://oldgoldandblack.com/?p=30248

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## \* Making water better, molecule by molecule

Israel's BGU will collaborate with UChicago to solve the world's water problems using nanotechnology

Israel's got one of the most advanced water desalination programs in the world and dozens of successful water conservation and reclamation projects. Now, cutting-edge Israeli research on water technology will make its way to American academia, as the University of Chicago and Ben-Gurion University have signed a partnership agreement to create new water production and purification technologies for deployment in regions of the globe where freshwater resources are scarce — based on nanotechnology.

The plan includes the establishment of a research center based in both Chicago and Beersheba where "the molecular aspects of water science and technology will result in a powerful new approach for addressing the various and pervasive challenges to the global water supply," said University of Chicago president Robert J. Zimmer at a March 8 signing ceremony in Chicago with BGU president Rivka Carmi.

Nanotechnology is the science of manipulating molecules to achieve positive results, and is responsible for major advancements in areas such as medicine and energy. As applied to water, nanotech could speed up and lower the cost of desalination, more effectively recycle wastewater, save water in manufacturing, utilize water better for energy production, and others. Ben-Gurion, located on the cusp of the Negev desert, is one of Israel's most experienced water technology institutions; the school has hundreds of patents for water technologies.

"BGU has been at the forefront of advanced basic and applied water-related research for more than four decades and has developed a number of innovative technologies in the field," Carmi said. "The collaboration with University of Chicago will result in the development of new technologies for the benefit of people all over the world."

Leading the Chicago side of the collaboration will be Matthew Tirrell, the Pritzker Director of UChicago's Institute for Molecular Engineering. Tirrell's team will include scientists from Argonne National Laboratory, which UChicago manages for the US Department of Energy. Leading the Israeli side will be Moshe Gottlieb, BGU's Frankel Professor of Chemical Engineering.



"Water is the most fundamental molecule for sustaining all forms of life, but it is in dramatically short supply in many parts of the world," Tirrell said. "Water in all parts of the world faces numerous threats, which in turn endanger human and economic health." The dangers include increased demand driven by energy production, agricultural runoff, depletion and contamination of aquifers by salt water and by industrial, organic and biological toxins.

"Such large-scale problems must be met by solutions developed from a comprehensive and integrated science and technology base of the type we will establish between the University of Chicago and Ben-Gurion University," Tirrell said.

"In this collaboration we intend to take advantage of the great strides achieved over the last decade in nanotechnology, materials science, biology, and chemistry at both institutions, and the world-class facilities available at Argonne National Laboratory," said Gottlieb. "These new tools and insights afford a molecular-level approach to tackle an age-old human plight."

UChicago and BGU researchers will meet next month in Beersheba to begin discussing interdisciplinary collaborative water-related research projects of technical and societal significance. Joint activities may include the exchange of visiting faculty members, researchers and students; the development of funding proposals for collaborative work; and the creation of innovative commercial technologies and new business ventures, BGU said.

"Making water better, molecule by molecule", 21/03/2013, online at: <u>http://www.timesofisrael.com/making-water-better-molecule/</u>

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#### ✤ Israel pushes settlers and Palestinians to cooperate on recycling

A new facility in the West Bank, built with World Bank funding and operated by Palestinian entrepreneurs, will likely serve both Palestinians and Jewish settlers.

Local Jewish and Arab leaders in the Nazareth region and Jezreel Valley said this week they intend to work together to protect the environment. Their plan to join forces at the municipal level has won the support of the Environmental Protection Ministry.

But while Israelis, both Jews and Arabs, are trying to cope with environmental problems, the situation is different on the other side of the Green Line. There the story of a new garbage dump shows how Israel is trying to force the Palestinians to join the settlers in solving environmental problems.

On a hill overlooking the Judean Desert east of Bethlehem, a site for storing refuse is being built. Called Al Minya, it will replace environmentally unfriendly sites and take in the garbage of cities and settlements in the Hebron and Bethlehem region. The facility is being built with World Bank funding, and Palestinian entrepreneurs will operate it.

The Palestinians have insisted for years that they will not share environmental infrastructure with settlers; in this way, they would avoid legitimizing the settlements. Still, over the years they have had no choice but to share refuse sites with settlements. Two of these sites are still in operation.

Al Minya is one of three new facilities that are supposed to serve the Palestinians exclusively. One of them is already in operation in Jenin, while another, Rimonim, is due to be built east of Ramallah. All are being built with funding from the World Bank or other international organizations. Israeli planning and environmental authorities have decided that Al Minya will also serve the settlements.

According to Nitzan Levy, CEO of the Municipal Environmental Associations of Judea and Samaria, there is economic and environmental sense to Israelis and Palestinians operating waste sites together. He says that without taking in waste from the settlements, the Palestinians will have a hard time operating Al Minya because their towns are hard-pressed to pay for storage.

Levy recently wrote that an attitude of cooperation, which already exists at some sites, should be adopted. "Joint solutions that private entrepreneurs carry out will probably provide the optimal solution through differential pricing for Israelis and Palestinians, reflecting the economic gaps between the sides," he wrote in an article.

According to investigative journalist Dror Etkes, who follows the settlements, it's clear a tacit understanding exists between the World Bank and the Civil Administration that settlers will also use Al Minya.



"The attempt to ease Israel's maintenance of the 'temporary' occupation of the West Bank and its numerous economic costs allows that same occupation to continue and become less temporary," he said.

It's still unclear whether Al Minya will serve the settlements, but the debate raises problems tied to the legal reality beyond the Green Line. It's about implementing a law for encouraging local authorities to opt for recycling over storage. Because this law does not hold sway in the Palestinian territories, the settlements have little economic incentive to recycle. They'd rather transport the waste to storage sites like Al Minya and pay a much lower fee.

Environmental authorities in the settlements recently suggested that the government enforce laws on waste in the settlements. A step like this would provide financial assistance to encourage recycling, but it would further strengthen the settlements.

"Israel pushes settlers and Palestinians to cooperate on recycling", 22/03/2013, online at: http://mideastenvironment.apps01.yorku.ca/?p=7005

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#### 'Use water as stepping stone toward peace'

Two experts present 'road map' on using natural resource as way to jump-start Israeli-Palestinian talks.

In an effort to support the possibility of achieving regional peace by beginning with cooperation on a shared natural resource, representatives of two local organizations sent US President Barack Obama a "road map" to Middle East peace that starts with water.

Because of the Palestinian Authority's "dire need" for water, Israel's increased water supply due to desalination and the joint need between the two to cope with untreated sewage, the issue of water could serve as a catalyst for generating a future overall peace agreement, the road map said. Encouraging an agreement on water issues could therefore only benefit both populations, wrote the authors – Israel director of Friends of the Earth Middle East Gidon Bromberg and Oded Eran, a senior research associate at the Institute for National Security Studies and a former ambassador to the European Union and Jordan.

Bromberg and Eran stressed that they felt that any water agreement would be a final accord on water and not an interim process, as was the Oslo agreement of 1993.

Forming such an agreement would help generate trust between two contentious groups and "give hope to both peoples that a diplomatic solution to their conflict is possible," the authors said.

Meanwhile, because the Israeli government is unlikely to bend on removing settlements or sharing sovereignty of Jerusalem in the time being, a more "incremental solution" such as a water agreement could be the "urgently needed win-win" for the two sides by mapping out the water rights of each group, the road map said.

In order to move such a plan forward, Bromberg and Eran suggested first that the Israeli government commit to a measure of goodwill – providing an additional 30 million cubic meters of water to the Palestinian Water Authority annually, at no cost, with southern West Bank cities becoming the first beneficiaries of the water.



For its part, the PA would need to declare that a World Bank sewage treatment plant planned for Hebron would be expanded to be able to treat all Palestinian sewage, which currently flows into Israel, the authors said.

Following these commitments, the two parties would jointly begin negotiations toward a final water accord, with mediators suggesting that such talks go on for no more than six months.

The accord itself would be based on principles of economic efficiency, social equality, ecological sustainability and practicality, the authors wrote. An ideal accord would mandate the creation of a Bilateral Water Commission, which would replace today's Joint Water Committee and make decisions on delivery of shared water and removal of sewage, as well as rates of water extraction. Within the commission would be an Office of Science Advisors made up of professional staff from both sides that could provide recommendations to the larger body.

In addition to the Bilateral Water Commission would be a Water Mediation Board, which would be able to take action if the commission is unable to accept a decision drafted by the Office of Science Advisors, the authors explained. Both the commission and the board would have equal numbers of Israeli and Palestinian representatives, plus one member from outside the region, they added.

"The guiding paradigm until this very moment has been that we need to agree on all the major core issues before there can be any agreement – that is to say we need to solve Jerusalem, refugees, the whole territorial issues before we can make an agreement," Eran told The Jerusalem Post on Monday.

"What we propose is changing the paradigm."

While the end-goal would remain the same – providing a comprehensive solution to the Israeli-Palestinian conflict – Eran stressed that the road map suggests beginning with feasible "issues that can be agreed upon now."

Water, to the authors, is an obvious issue to begin with because the Palestinians can benefit almost immediately with increased amounts of the resource to their villages, and Israel can benefit in the context of coping with environmental problems posed by sewage, Eran explained.



Before drafting the proposal, Eran said that he and Bromberg visited the Hebron area to observe the sewage flowing through the Hebron Stream. The poisonous materials filling those waters cross through both Palestinian and Israeli urban centers, and into the Mediterranean Sea, he noted.

Eran said that the authors passed on their road map to US Ambassador to Israel Dan Shapiro, who said he would relay the proposal to the president.

"We would have liked to see the president of the US launch the negotiations over water and invite the two sides to come to Washington," Eran said, noting, however, that they have not yet received a response. "In our view, this could be done fairly."

First and foremost, such a road map to peace has a capacity to be more productive than the Oslo agreement because it is final rather than temporary, Bromberg added.

"It creates a precedent that we can reach a final agreement and in the process shows that there are partners to the process on both sides, and that a mechanism would be put in place that builds trust between the two parties – which is very much the missing link," he said.

"'Use water as stepping stone toward peace", Jerusalem Post, 19/03/2013, online at: http://mideastenvironment.apps01.yorku.ca/?p=7013

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# USAID in the Middle East: Using Data to Improve Regional Water Management (part 1)

Few places are drier than the Middle East and North Africa. Host to 5 percent of the world's population, the region has only 1 percent of the world's renewable fresh water. Population growth and increasing demands for food, housing and jobs place extreme pressures on water resources, raising the potential for conflict within and between countries. Climate change could make a challenging situation worse.

The first step for effective water decision-making is data – understanding the location, availability and quality of water resources. To be effective, water management decisions need to be grounded in the best information available. However, political and economic constraints often mean that decisions affecting water use in the region rely upon outdated or inaccurate information.

USAID is working to put accurate data – and the know-how to interpret them – into the hands of the region's water decision-makers. Since many in the region access shared water resources we are also promoting international cooperation and data sharing toward effective regional water management. Our <u>Middle East Regional Cooperation</u> program (MERC), for example, brings together teams of Arab and Israeli scientists to address common development problems.

This series profiles several initiatives focused on data, technology, cooperation and decision-making. Last year's World Water Day edition of <u>Global Waters</u> portrayed others.

USAID's work around the region has helped to improve water and wastewater services available to the region's citizens, lessen the potential for water-related conflicts, encourage cooperation and increase the region's ability to adapt to climate change and maintain food security. Water plays a central role in every country's development. Its availability and quality can hinder or accelerate socio-economic progress. As former Secretary of State Hillary Rodham Clinton <u>noted</u>in her 2012 World Water Day speech, "the water crisis is a health crisis, it's a farming crisis, it's an economic crisis, it's a climate crisis, and increasingly, it is a political crisis. And therefore, we must have an equally comprehensive response."

Effective water decisions require accurate data. Using science and technology to improve water decision-making, USAID is helping the region to overcome scarcity, and ensure that water serves as a catalyst for sustainable development.



#### **Regional: In Jordan and Elsewhere**

Effective water management requires a regional approach. Water does not necessarily abide by the man-made lines drawn across the sand marking today's international borders. Rather, it flows – above and below ground – along lines understood by geographers, not those drawn by cartographers. Therefore a transboundary approach, informed by accurate water resources data and decision-making tools, is essential. USAID has taken the lead in making available U.S. satellite data and remote sensing capabilities to key regional water decision-makers.

Joining forces with NASA's Goddard Space Flight Center, the World Bank, the International Center for Biosaline Agriculture (ICBA), and national agencies in Jordan, Lebanon, Tunisia, Egypt and Morocco, USAID has developed a suite of advanced land surface models to provide regional scale hydrological data relevant to water resource planning and management. Satellite data is verified by local government measurements and fed into analytical models to turn raw data into decision-support tools.

"The overarching goal of these projects is to improve the data available to researchers and decision makers and help foster a culture of data-informed water resources policy and management," said Mark Peters, USAID's Regional Water Advisor. "USAID is playing an important role in making the most of increasingly scarce regional water resources around the Middle East. Our programs demonstrate the importance of science and technology in water resources decision-making, using data and decision-support tools to make optimal use of water resources and mitigate against water-related conflict."

For example, in <u>Jordan</u>, one of the most water-scarce countries in the world, USAID is working closely with the Ministry of Water and Irrigation (MWI) to ground-truth NASA satellite data. The detailed satellite information on groundwater levels and vegetative cover are used in conjunction with population statistics and measures of water levels in wells throughout Jordan to enable NASA and USAID scientists to accurately track water levels in aquifers throughout the country. Making use of this resource, USAID and the MWI are able to improve water resource planning efforts, and avoid the over-depletion of key aquifers.

Models indicate that certain aquifers are at risk of over-depletion, and as a result USAID and MWI have redoubled efforts to reduce agricultural water use in these areas. Such findings are reinforced by



cooperation between Jordanian scientists and the U.S. Geological Survey evaluating groundwater level and salinity trends around the country. Data produced as a result of this cooperation help prioritize locations for groundwater management, provide a baseline for evaluating impacts of the reduction of over-pumping, and increase public awareness of groundwater trends. "There is severe over extraction of the highlands aquifers," argues MWI Secretary-General Basem Telfah. "With new information coming from both our well and satellite monitoring systems, it is very clear that Jordanians have to act quickly to change agricultural practices."

Sound water management begins with good data provision. Groundwater resources are under increasing pressure in the MENA region, and declining levels in many aquifers highlight the need for careful future management. Given the growing and diverse needs for water, decision-makers need to understand current resource limits and the impacts of future policies as they balance competing demands. The United States is a leader in using satellite data and remote sensing technologies to inform water decision-making. We are making available these powerful tools around the arid Middle East as the countries of the region chart their own hydraulic future.

"USAID in the Middle East: Using Data to Improve Regional Water Management (part 1)", 20/03/2013, online at: http://blog.usaid.gov/2013/03/usaid-in-the-middle-east-using-data-to-improve-regional-water-management/

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#### **USAID** in the Middle East: Famine Early Warning Systems Network (Part 2)

In arid parts of the Middle East and North Africa, famine and climate-related food shortages remain critical development concerns. In sub-Saharan Africa, after devastating famines in the 1980s, USAID created the Famine Early Warning Systems Network –<u>FEWS NET</u> –to monitor and predict developments that affect food security. The system has been serving the region ever since. Among its accomplishments, FEWS NET is known for pioneering the application of satellite remote sensing and models to track and predict climate-sensitive aspects of food security.

There is a powerful interdependence between water availability and agriculture, health, nutrition, and political and economic development. In Yemen, for example, variable rainfall has decreased crop production, food prices are rising, and declining GDP growth and security diminish the population's ability to obtain adequate nutrition. Today, more than 10 million Yemenis face food insecurity, as do 8 million citizens of Sudan and South Sudan. In Sudan, rainfall has declined by 20 percent since the mid-1970s, with acute impacts for pastoral communities reliant on rainfall for crop production.

Without a stable and sufficient food supply, little other development is possible. Climate change threatens to further destabilize the situation, and recent changes in weather patterns and rainfall have already exacerbated regional water resource management problems. Rain-fed agricultural productivity is particularly vulnerable to shifts in precipitation patterns. Resilience to climate change is critical to ensuring that broad-based development priorities can be met. As Jose Graziano Da Silva, director-general of the U.N. Food and Agriculture Organization, puts it, "there is no food security without water security."

FEWS NET staff collaborates with U.S. Government agencies, national government ministries and international partners to collect data and produce objective, forward-looking analyses on more than 30 of the world's most food-insecure countries. FEWS NET helps guide adaptation efforts by providing high quality analyses of recently observed climate trends.

The importance of early warning is critical. With adequate lead time, governments, development agencies and citizens have the opportunity to plan for and mitigate the impact of climate developments. FEWS NET provides continuous monitoring of weather, climate, agricultural production, prices, trade and other factors, and thus can predict and plan for emerging problems. Pioneering in its analytical approach, FEWS NET forecasts the most likely climate patterns up to six


months in advance. To help government decision-makers and relief agencies plan for food emergencies, FEWS NET publishes monthly reports on current and projected food insecurity, up-to-the-minute alerts on emerging or likely crises, and specialized reports on weather hazards, crops, market prices and food assistance at <u>www.fews.net</u>.

Programs like FEWS NET are putting to work leading American science and technology in support of effective regional water management and decision-making. "Much of the information that we rely on comes from FEWS NET," says Abdoulaye Diop, director of the World Food Program in Malawi. "It is quite valuable...no one else on the ground can provide this type of information."

"USAID in the Middle East: Famine Early Warning Systems Network (Part 2)", 22703/2013, online at: http://blog.usaid.gov/2013/03/usaid-in-the-middle-east-famine-early-warning-systems-network/

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SAID in the Middle East: using data to improve regional water management (Part 3) USAID has supported Egypt's water sector – including its water and wastewater utilities – for more than three decades. Much of Egypt's water and wastewater infrastructure built since the early 1980s – including treatment plants and water distribution networks – has been developed with U.S. assistance. Before USAID's involvement, water and sanitation services were unevenly provided by a mix of municipal services providers and regional authorities. In 1975, for example, 70 percent of Egyptians had access to piped water; today, nearly 100 percent do. Accurate and consistent data were rare. Data aggregated nationally were difficult to verify. As elsewhere in the region, U.S. assistance strives to make available accurate data and decision-support systems to improve water-related decision-making.

The latest generation of USAID assistance works to ensure the sustainable stewardship of Egypt's water infrastructure by emphasizing the management systems required to make the most of past infrastructure investments. With USAID assistance, major infrastructure investment and regulatory reform projects were launched, and the local water and wastewater departments were restructured and consolidated as operating subsidiaries of a national holding company. A key element in USAID's approach is creating the systems to track and monitor data, and indicators to monitor service quality, the efficiency of water applications, and the cost-effectiveness of capital investments.

In Egypt, five national agencies are involved with construction and maintenance of water supply infrastructure. Until recently, there were no systems in place to track the thousands of construction projects underway nationwide at any given time. This inability to track and monitor construction progress led to poorly informed investment decisions and inadequate cost control. In 2006, the newly-installed minister overseeing these efforts requested U.S. assistance to establish a capital investment project tracking tool. Today, this system provides real-time summaries of over 3,000 construction projects underway, helping to prioritize investment decisions, quantify the expected impact, and justify and explain investment decisions.

Another USAID funded system provides a platform for tracking utility performance against key indicators for national- and regional-level managers. The system, installed in all 25 of Egypt's water and wastewater companies, tracks a wide variety of data on a quarterly basis, including figures on utility finances, customer service, drinking water quality and efficiency of operations. The



comprehensive and standardized set of indicators allows leadership to review performance, make accurate comparisons across utilities and detect inefficiencies. Mohamed Hassan, executive director of the Egyptian Water Regulatory Association, credits the USAID system for "allowing the water sector regulator to track the performance of water and wastewater utilities and customer-based level of service indicators, and assisting in tariff and licensing decisions."

Today, a range of USAID systems and tools are being used by sector officials, making use of American technical expertise to improve local water management. Using these and other management tools, USAID is helping monitor performance, prioritize and track investments, and effectively make the case for water and wastewater investments.

"USAID in the Middle East: using data to improve regional water management (Part 3)", 23/03/2013, online at: http://blog.usaid.gov/2013/03/usaid-in-the-middle-east-using-data-to-improve-regional-water-management-part-3/

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#### **\*** Water Projects as part of the Middle East Regional Cooperation Program (Part 4)

USAID's Middle East Regional Cooperation (MERC) Program promotes cooperation between the Arab and Israeli scientific communities through joint research projects addressing common development problems. The program was established in 1981 to facilitate research cooperation between Egyptian and Israeli scientists, and was subsequently expanded to include Jordan, Lebanon, Morocco, Tunisia, and the West Bank and Gaza.

Today, active projects involve more than 400 Arab and Israeli scientists, engineers, students and technicians at 50 institutions in seven Middle Eastern countries. New project proposals which seek out sustainable solutions to regional development challenges are accepted every year. Working together, these scientists have led innovation in agriculture, environment, water resources and health.

Given the region's water shortages and the regional nature of water challenges, the water sector is an important component of MERC's research portfolio. Because agriculture consumes a large amount of the region's freshwater resources, MERC projects seek to increase the use of treated wastewater as appropriate in agriculture, minimize water demand in existing crops, and identify new crop varieties that are resistant to drought and salinity.

For example, MERC programs explore the use of wetlands and membrane-based filters for the effective and efficient re-use of reclaimed water in agriculture. Its programs model crops' abilities to make use of low-quality water, seek the optimal amount of water plants need, and develop protocols for the safe and effective use of reclaimed water. They identify and optimize high-value traditional and specialty crops suitable to arid climates and saline soils, such as potato varieties adapted to saline soils and water, and virus-resistant tomato lines.

As do USAID's other water projects around the region, MERC's water portfolio makes use of cutting-edge science, technology and innovation in improving the impact and sustainability of its initiatives. One new project, for example, brings together Israeli and Palestinian scientists to look at the interaction between coastal aquifers and the Mediterranean under changing conditions. The scientists are developing empirical, quantitative estimates of seawater intrusion and freshwater outflow along the coast in and near Gaza. They will subsequently provide policy makers with recommendations about how best to manage these aquifers.



The re-use of wastewater is a growing practice in the region. Another MERC project studies the hormonal health hazards related to this re-use, the effectiveness of new wastewater treatment plants in removing hormonal pollutants, and the cost-effectiveness of new treatment alternatives. Project leader Alon Tal from Ben-Gurion University, who works with Israeli and Palestinian scientists from Bethlehem University and other groups to implement the project, commented, "I think this is going to take to the next level what we know about streams."

Today, at a time of rapid change in the Arab world, MERC continues to bring together Arab and Israeli scientists and students to create and share solutions to regional development challenges like water while promoting a peaceful exchange between neighbors.

"Water Projects as part of the Middle East Regional Cooperation Program (Part 4)", 24/03/2013, online at: http://blog.usaid.gov/2013/03/water-projects-as-part-of-the-middle-east-regional-cooperation-program-part-4/

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## \* After droughts and flood, project aims to preserve Sinai mountain gardens

Around St. Catherine's Monastery, encircled by the high South Sinai mountains, lie hundreds of Bedouin gardens nested in the nearby wadis, or valleys. These gardens, which were initially built during the Byzantine period by monks, hermits and settlers from around the Mediterranean, have been the responsibility of the Jabaleya Bedouins for more than a century.

A severe drought that lasted for years in the peninsula, coupled with an unprecedented amount of precipitation and snow that fell over the mountains early this year, has badly damaged some of these precious shrines to biodiversity.

Because the houses are built of stone and rooftops from a mix of rocks and sand, the continuous rainfall pushed against the roofs, which finally collapsed under the strain.

With many Bedouin families relying on these mountain orchards for their livelihood, the collapse of the buildings and fences, and the destruction of the trees was a disaster. To finance the rebuilding of these enclaves, members of the Jabaleya tribe have now launched an alternative tourism project inviting volunteers to participate in restoration efforts.

Entitled "Help Rebuild the Bedouin Gardens and Discover the Sinai High Mountains," the project is still in its early stages but tribe members plan to bring visitors to the gardens to stay with local families and help with reconstruction work. They will also be asked to provide a donation directly to gardeners to hire workers, buy building materials and cover transportation costs.

"These gardens provide livelihoods for us, as there are no job opportunities in the city," says Sayed Musa, the Bedouin man from the area in charge of the project, who has 10 years experience as a safari and trekking guide. "The situation for many families is now extremely tense. They have lost all their income and are no longer self-sufficient for food."

Some of the gardens are sited in narrow valleys. During periods of heavy rainfall, the water pours into the wadis, flattening everything in its path.

"These gardens are part of my tribe's heritage," says Musa, who takes his two sons with him whenever he goes to work. "I want to make sure they have the know-how to become the garden's caretakers when I am too old to work."

The gardens are mostly designed to withstand the heavy flash floods that sometimes sweep through the region, while collecting as much water as possible. The system doesn't work in times of continuous rainfall, however.



Zoltan Matrahazi has been a resident of St. Catherine since 2005 and is also the author of the book "Sinai Gardens." Royalties from his book are transferred to the South Sinai Foundation and are used to support gardeners.

On countless occasions, he has volunteered to work in the gardens. He is also behind the website advertising the project.

"There are about 200 Bedouin gardens in the high Sinai mountains, located about a day's walk from the monastery," he says. "But I'd say that no more than 75 of them are being taken care of."

He says most of the gardens that grow in these green enclaves are not found anywhere else in the country. They are often the result of grafting high-yield fruit species on native trees — including almond, apple, peach and plum trees — which relies on a century-old system adapted to the Sinai mountains' soil and climatic conditions.

"Most of these varieties wouldn't otherwise survive in this harsh environment," he says.

In addition to the fruit trees, the gardens also help preserve native aromatic herbs like habaq (dry mint), mardakoosh (marjoram) and zaatar (oregano), as well as medicinal plants.

"After periods of drought, there is rain fall and most of the plants come back to life," Zoltan stresses.

Musa explains that the gardens not only sustain the families' livelihoods, but also offer food and water to birds, which are numerous in the protected area.

Wildlife photographer Dina Aly has dedicated a book to the wildlife of South Sinai. She is familiar with the fauna and flora of the St. Catherine area, and explains that a specific bird species — the Tristram's Grackle, a species of starling — feeds on harvest leftovers that are unfit for human consumption.

"When pomegranates are infested with bugs, this bird will eat it, just like they would eat olive leftovers," she says.

In times of drought, the gardens also act as sanctuaries for wildlife, since they provide food and water for many mountain creatures.

"Many of the gardens' caretakers are not hostile to ibexes coming down to drink water, although this does not happen very frequently," she adds.

Aly thinks the project provides an excellent way to preserve the gardens by inviting people into the area to help solve the problem. A few years ago, she says, tribes in the area also adopted an excellent



environmental practice forbidding grazing in certain areas for a season. This enabled the wadis to flourish again and provide nutritious food for the animals the next season.

"This grazing embargo has stopped for a while but I think they should reintroduce it because it was extremely efficient," she says.

Matrahazi explains that many of the gardens have simple but adequate facilities, such as composting toilets and showers, and several Bedouin safari and trekking guides also participate in the project so that visitors feel comfortable.

"The project is run by the Bedouin gardeners themselves, with a nominated representative being responsible for dealing with visitors and the logistics of the program," Matrahazi says.

"After droughts and flood, project aims to preserve Sinai mountain gardens", Egypt Indpendent, 22/03/2013, online at: http://mideastenvironment.apps01.yorku.ca/?p=7007

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## **\*** Experts debate water disputes of Kashmir and Palestine

Brussels: International Council for Human Rights (ICHR) and International Human Rights Association of American Minorities (IHRAAM) in association with Phil Bennion MEP hosted an interactive dialogue and roundtable discussion entitled Thirsting For Justice at the Residence Palace here. The roundtable explored the prevailing situation and approach of the international fraternity towards the environmental concerns and human rights in relation with the water disputes. It cited the existing lacunae and also posited the vitality of ensuring the human rights and quality environment. In this respect, the roundtable focused on the Indo-Pak water dispute and the Kashmir issue and the Israeli-Palestinian water dispute.

Wide range of participants included diplomats, personnel from the European Commission and the Parliament, UN representatives, NGO representatives, civil society leaders, human rights defenders and other interested parties.

Speakers included Barrister A. Majid Tramboo, Chairman of ICHR and IHRAAM's Permanent Representative to the UN, Mr. Phil Bennion, Member of the European Parliament, Ms. Jean Lambert, Member of the European Parliament, Mr. Helmut Scholz, Member of the European Parliament, Professor Nazir Shawl, Chairman of the International Chamber of Peace and Conciliation, Professor Ashok Swain, water expert from Uppsala University, Dr. Undala Alam, Indus Water Treaty expert from Warwick University, Dr. Nidal Salim, Director and founder of the Global Institute for Water Environment and Health (GIWEH), Mr. Almotaz Abadi, Special Advisor to the Palestinian Minister of Water Authority, Professor Haim Gvirtzman, the Institute of Earth Science at Hebrew University, Ms. Josephine Barbas, Legal Researcher in the Legal Research and Advocacy Department at Al-Haq Organisation, and Mr. Frank Schwalba-Hoth, Political Strategist and former Member of the European Parliament.

Chairing the first part of the event, Mr. Phil Bennion MEP thanked Barrister A. Majid Tramboo and ICHR for organising the event. He stated that the importance of water lies not only on its use in agriculture but also in washing, sewage, cleaning and in it is use for everyday activities. He stressed that it is necessary to acknowledge the importance of cooperation when dealing with water resources



given the existence of many cases where there are political problems between neighboring countries sourced on the management of transboundary water. He affirmed that it is important to realize that water management can also mean an opportunity to increase collaboration.

In his opening remarks and moderating the roundtable, Barrister Tramboo thanked all the guests for participating in the event and invited the speakers to suggest recommendations for the situation of water in conflict. Barrister Tramboo underlined that despite complex situations, record shows that water disputes can be handled diplomatically. Nevertheless, he accentuated that treaties still reveal significant weaknesses since it is countries themselves whom, at the end spell out the applicability of the conventions on their watersheds, so is the case of Pakistan and India and the overlooked role of Kashmir over the water dispute within the region.

Professor Nazir Shawl opened his intervention by affirming that, despite decades of attention, the Kashmir dispute remains one of the most persistent and heated conflicts in international relations. He further elaborated on the current situation stating that water emanating from Kashmir has been gravely misused; more than 67 dams and barrages have been constructed by India in Indian Held Kashmir for the purposes of hydro electrical power generation; this has created many problems for Kashmir and Pakistan. Prof. Shawl emphasized that Kashmiris have been deprived from their own resources by the limitations of the Indus Water Treaty and the desired flow to Pakistan is also threatened. He went on saying that Jammu & Kashmir has been stuck in a development rut that is largely responsible for the lack of stability and security that could play a critical role in the conflict resolution.

Professor Ashok Swain highlighted that despite the lack of trust between Pakistan and India there has been an agreement for more than 52 years. On the other hand, the treaty is 53 years old and it no longer takes the current reality into account. He then stressed on the need to move forward onto a treaty that takes into consideration the Kashmiri needs and demands. He elaborated on how the damns can and are used for geo-strategic purposes but reminded that they also should be used to benefit the region as a whole. He concluded that both India and Pakistan should come forward to renegotiate the Indus Water Treaty Agreement into a comprehensive and integrated form of basin management and establish a joint and independent river basin organisation, the benefit sharing of it



will not be limited only to water resources; it might have other peace-enhancing effects and significantly contribute to the regional security and development. It is high time now to move to the next stage in Indus river cooperation.

Dr. Undala Alam emphasised that the Indus Treaty is the only one that has had the World Bank as signatory and that despite it being improbable it still is a remarkable treaty. She particularized that the critical thing about water lies on the fact that it flows; hence water differentiates itself from gold, oil or coal because it cannot be contained, one can only have the illusion of containing it, it will always move on. She brought up the intergovernmental cooperation on the Senegal Basin as an example of outstanding cooperation.

Jean Lambert MEP referred to the 2007 European Parliament resolution on Kashmir and explained how it made reference to the Indus Water Treaty; it urged the Governments of India and Pakistan to resolve the crucial river issues affecting the use of the rivers flowing through Kashmir as swiftly as possible. It also talked about water security and sustainable energy supply for the stability and growth of the region, and to consult the Kashmiri views over the river issues. She also addressed the issue from an ecological point of view stressing the effect pollution and climate change is having on the water conflict in South Asia. She also underlined the economic impact water and its quality has in cotton production, a huge sector in the region's economy.

Helmut Scholz MEP began by giving the water dispute between Germany and the Czech Republic as an example of how cooperation on water is needed all around the globe. He highlighted that water is also highly important for transport and farming activities. As a member of the Committee on International Trade he remarked that, in relation to water, trade can offer a good opportunity to even economic differences between neighboring countries.

The roundtable discussed in its second part the Palestinian-Israeli water dispute and the human right to water and sanitation in the region. On behalf of the Palestinian Minister of Water, Mr. Almotaz Abadi gave the Palestinian official stand on water issues. He stated that in the occupied State of Palestine a severe water shortages and acute water quality problems continue to negatively affect the lives and livelihoods of more than 4.2 million of Palestinians living in the West Bank and Gaza Strip.



He declared that without access to and control over their rightful share of the trans-boundary freshwater resources located in the occupied West Bank, and without an end to Israel's punitive land, air and sea blockade over the Gaza Strip, Palestinians have little hope of improving their current economic situation and no hope of building a sovereign and viable Palestinian state.

Professor Haim Gvirtzman alleged that water supply under Jordanian Control over Palestine was far less developed than during Israel control. He elaborated on Israeli water control by declaring that 98% of Palestinian villages and towns are now connected to water supply provided by Israel's water companies, therefore, water supply has tripled in comparison to Jordanian ruling.

Ms. Josephine Barbas gave a different approach to the discussion by addressing the topic under the terms of international law. She explained how the Oslo Accords of 1994 did not have the expected outcome since there was not any improvement of Palestinians access to water. She stated that 60% of the West Bank -thus the access to seawater- is controlled by Israel. She appealed that Palestinians have no access to their rightful water resources. She further addressed the water dispute and Israel's water control by analyzing it under 3 legal frameworks: the International Humanitarian Law, the International Human Rights Law and the International Water Law.

Dr. Nidal Salim described with figures how difficult it is to the Palestinians to access water and how the lack of accessibility is affecting their health. He stated that destruction of water cisterns, wells and other essential water infrastructure, access to water has become a tool of disposition used by Israel to target some of the most vulnerable Palestinian communities in the occupied Palestinian state resulting in forced displacement and that the current conflict is not between two equals but between one with all the power and another one who is not powerful and hence is being invaded.

Concluding the roundtable, Mr. Frank Schwalba-Hoth stated that development is one of the priorities of the EU over the last decades and indicates it clearly: in the fifties "water policy" was a non-issue, now it has become - in its different facettes - one of the key concerns of the EU. We are confronted with armed conflicts as a consequence of water shortage and lack of respectful cross-border water arrangements; with a decrease of food production through depletion of aquafers; with health problems through water pollution; with social injustice through water privatisation. What is needed is



more regional cross-border water manangement and a push towards a new generation of desalinisation technology through decentralised units for local residents. He declared that the EU has to accept its leadership role in a sustainable water policy worldwide.

The roundtable panelists presented various recommendations which will be compiled in due course of time.

"Experts debate water disputes of Kashmir and Palestine", 21/03/2013, online at: http://kashmirwatch.com/news.php/2013/03/21/experts-debate-water-disputes-of-kashmir-and-palestine.html

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## **\*** Everyone Needs a Place to Go

Keo Samon, a rice farmer in southeastern Cambodia, had no toilet in her home. Nor was there even an outhouse or latrine for Keo and her husband and five daughters. Instead, they would defecate on land around the home or in the rice fields.

That changed after the Water Supply and Sanitation Council, a United Nations partner, began to work with her village. Keo's family, along with 30 others, attended community-led awareness sessions, built simple dry toilets and joined the drive to make their village "open defecation-free."

"In the past, I did not know the consequences of defecating outdoors. It was simply my habit, like others in my village. We were not aware of the importance of good hygiene. But now, I am very excited to have my latrine," Keo said.

What good does a toilet do? More than you may imagine. Adequate sanitation prevents disease or malnutrition caused by contaminated water. Open defecation -- practiced by <u>more than 1 billion</u> <u>people around the world</u> -- is among the main causes of diarrhea, which kills more than <u>three-fourths</u> <u>of a million children</u> aged 5 or under each year.

Sanitation is also a necessary path to protection and empowerment for women and girls. When schools lack toilets, girls stay home when they are menstruating. When adequate sanitation is unavailable, women and girls are forced to take their private needs to the open, leaving them subject to sexual abuse.

Finally, there is the economic argument. Poor water and sanitation costs developing countries around <u>\$260 billion a year</u> -- 1.5 percent of their gross domestic product. On the other hand, every dollar invested can bring a five-fold return by keeping people healthy and productive.

So, it is difficult to understand why, in 2013, <u>2.5 billion people</u> around the world still lack access to adequate sanitation. More people have cell phones than toilets in today's world.

Since the adoption of the <u>Millennium Development Goals</u> (MDGs) in the year 2000, global poverty rates have been <u>reduced by half</u>. So has the proportion of people without access to improved sources of water -- <u>200 million slum dwellers</u> live better lives. Enrolment in school has increased dramatically. The global mobilization behind the MDGs has been a remarkable success that has



changed the world's approach to development for the better. Yet, with just over 1,000 days remaining before the 2015 deadline for achieving the MDGs, we are not even close to reaching the goal on proper sanitation. That is why I am, on behalf of the Secretary General and the U.N., launching a call to action on sanitation as we mark the beginning of the International Year on Water Cooperation. There are three things we can do to speed up progress on sanitation. First, we should speed up the elimination of open defecation -- country by country, community by community, family by family. We need to talk about the problem, not turn our heads away from a subject many find uncomfortable.

Second, we need to strengthen cooperation. The water and sanitation challenge is everybody's business. We need everyone to play their part. National governments need to lead by making commitments. Local governments can work with communities to help them to help themselves. The private sector can invest in the health of their employees and the environment. And civil society organizations can monitor progress and advocate for solutions.

Third, we should scale up the projects that work. Simple, affordable actions have already proved their worth. Between 1990 and 2010, about <u>1.8 billion people gained access to sanitation</u> -- a significant achievement. Many countries have tackled this problem within a generation.

Doing nothing is not an option. The social, economic and environmental cost is simply too high. Let us commit now to end open defecation and provide adequate sanitation and safe water for all -- so women and girls can live with dignity; so our children can survive and communities can thrive.

Keo in Cambodia reports that all her family members are now using the latrine. They are drinking safe water. "I ask all families in my village to start building latrines for their use. This will help our village to end open defecation and bring good health for everyone, especially our children."

Keo has set an example. Let us follow -- one community at a time. Nobody can do everything -- but everybody can do something.

"Everyone Needs a Place to Go", 21/03/2013, online at: <u>http://www.huffingtonpost.com/jan-eliasson/water-sanitation\_b\_2908690.html</u>

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## \* Water, energy and food security triangle in Gulf

All countries except Oman fall in category of 'acute scarcity' of water

Istanbul: Middle Eastern states that have been self sufficient in meeting their demands for water may need to look at the water situation in Gulf states as their own water resources rapidly decline. The Gulf region is arid and has little of its own freshwater resources to rely on. According to the United Nations, all the GCC countries except Oman fall in the category of "acute scarcity" of water. This means that these countries have an annual renewable water capacity of less than 500 cubic meters per capita.

In the Gulf region, water security, energy security and food security are tied to each other. Despite the worrying figures, the region's countries are largely seen as 'water-secure' – for now. This security is attainted due to the uniqueness of the Gulf's demographic situation and the abundance of energy resources, but as it is explained below, the lifeline of this model is not too long.

#### The water dilemma

Desalination plants: A lack of water resources this arid region forces Gulf states to rely on energyintensive desalination that makes sea water suitable for agricultural and domestic use. This is made possible due to the Gulf's abundance in energy resources and small populations, which allows them to export the bulk of their hydrocarbon production. This method is however not ideal. Sixty-five per cent of the GCC states' water demand is met through desalination, and that is expected to rise in the coming years since it is expected that the supply of water will satisfy only 67 per cent of demand by 2015.

Attempting to secure food: Irrigation of grass or farms: Despite agriculture accounting for less than five per cent of the Gulf states' collective GDP, governments have given a boost to the sector by providing artificially cheap water in an attempt to attain food security. Eighty-five per cent of the region's water is used in this sector, most of which is treated waste water. The GCC states are only 15 per cent self sufficient in meeting their demand for cereals, 65 per cent for fruits and 70 per cent in vegetables.



Diverting energy resources: With urbanization, industrialization, and a population explosion however, Gulf states are having to look to alternative sources of energy, such as nuclear power and renewable energy. This allows them to use alternative sources of power for desalination and divert hydrocarbon resources, their largest source of revenue, towards the export market. This is seen as an essential measure for the economic stability of Gulf states and the continuation of the generous welfare programs made available to citizens.

Food insecurity: Knowing well that Gulf states cannot be totally self sufficient in meeting food demand, alternative options have been attempted. Gulf states have been importing large quantities of food for several decades, but have more recently begun to purchase of farmland abroad. Relying on food imports is risky due susceptibility to price shocks and export bans like that of 2008, and purchase of farmland abroad is controversial as such transactions are carried out with weak governments in poor states that have been criticized for disregarding the long term impact of the sales. Since 2006, approximately 15-20 million hectares of land in poor countries has been sold to foreign buyers. States like Thailand and the Ukraine have banned the sale of agricultural land.

# Spotlight on Yemen: a water crisis

Yemen faces a chronic water shortage that threatens to plunge the country into an even deeper crisis than it is in at the moment. Only 3 per cent of Yemen's land is arable, and it has one of the lowest rates of per-capita freshwater availability (125 m3 per capital per year). It is among the 10 most food-insecure countries in the world, where per capital water consumption, at 125 m3 a year, is 1.6 per cent of the global average of 7,500 m3. With a lack of regulation, groundwater is depleting. It is estimated that 99 per cent of all water extraction is unlicensed. And since the agricultural sector, a source of livelihood for two-thirds of the population, uses 90% of available water resources, the chance of instability, conflict and mass migration are likely to rise with the depletion of water resources.

The culprit for much of Yemen's water depletion is arguably the habit that has plagued the country: the chewable narcotic called 'qat' that is sucking the country dry.

- Irrigated land area tripled between 1970 and 2000, largely because of irrigation to grow qat
- The qat industry accounts for a quarter of the entire economy



• >50% of agricultural water use goes to qat cultivation

• 70% of arable land is used for growing qat, while the country annually imports 2.5 million tons of wheat

"Water, energy and food security triangle in Gulf", 21/03/2013, online at: <u>http://gulfnews.com/news/gulf/oman/water-energy-and-food-security-triangle-in-gulf-1.1161347</u>

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# Connecting the Drops – An Indus River Basin Roadmap

The Stimson Center, the Sustainable Development Policy Institute (SDIP) and the Observer Researcher Foundation have just released "<u>Connecting the Drops: An Indus Basin Roadmap for</u> <u>Cross-Border Water Research, Data Sharing, and Policy Coordination</u>." This is the product of six months of dialogue and collaboration between an Indus Basin Working Group, comprised of twentyfive analysts and practitioners who sought to identify critical knowledge gaps, prioritize research questions, and formulate practical approaches for meeting needs.

The Indus River Basin is an important geography. According to the report:

It supplies the needs of about 300 million people and nourishes the breadbaskets of the subcontinent, watering fields in India and Pakistan that constitute the most intensely irrigated area on Earth."

Some additional numbers gleaned from the roadmap's introduction are striking, and worth noting:

- The Indus River Basin is spread between several countries: 47% in Pakistan, 39% in India, 8% in China and 6% in Afghanistan.
- The Indus River Basin makes up 65% of the total area of Pakistan, 14% of India, 11% of Afghanistan and 1% of China.
- Agriculture accounts for 93% of the total water withdrawn from the river while industrial and domestic water demands account for 7%.
- Pakistan abstracts three quarters of the river's flow to provide 95% of the country's irrigation needs. Farming in Pakistan employs 40% of total labor force and generated 22% of its GDP.
- India generates a quarter of its grain production from the Indus river, and in total agriculture, comprises 17% of GDP and occupies 55% of the economically active population.

These numbers clearly paint the surface of a very complex system of shared waters that are already severely stressed, notwithstanding the effects of climate change.

In this context, the report offers a long list of detailed recommendations, which range from improved agricultural water-use efficiency, to deepening knowledge of glacial melt trends (a critical question given the Indus River Basin's dependence on glacial waters).



The authors make the case that cooperation between the nations sharing the basin are in their best interest, and could be critical for mitigating security risks.<u>According to David Michel</u>, the lead researcher on the report from the Stimson Center:

Indian-Pakistani cooperation will result in more effective management of the basin's water resources than confrontation between the two nations

Though the future of the region is uncertain, with likely increases in demand for the river's waters, and growing climatic change risks to water security, this roadmap makes important strides towards asking the right questions, and highlighting opportunities for cooperation in the region.

"Connecting the Drops – An Indus River Basin Roadmap", 22/03/2013, online at: <u>http://climateandsecurity.org/2013/03/22/connecting-the-drops-an-indus-river-basin-roadmap/</u>

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## Study warns of imminent water crisis

A new study prepared jointly by the Asian Development Bank (ADB) and Asia-Pacific Water Forum warns that more than 75% of the countries in Asia and the Pacific are experiencing a serious lack of water security, with many facing an imminent water crisis unless immediate steps are taken to improve management of water resources.

The ADB's vice president for knowledge management and sustainable development, Bindu Lohani, said: 'While the Asia-Pacific region has become an economic powerhouse, it is alarming that no developing country in the region can be considered "water secure". Countries must urgently improve water governance through inspired leadership and creative policymaking.'

The Asian water development outlook 2013 provides the first quantitative and comprehensive analysis of water security on a country by country basis in the region. It examines all dimensions of water security from the household level to water-related disasters, and uses indicators and a scaling system to rank the progress of each of the 49 countries assessed.

The study found that 37 developing countries in the region are either suffering from low levels of water security or have barely begun to engage in the essential task of improving water security. Twelve countries are shown to have established the infrastructure and management systems for water security, while no country in the region was found to have reached the highest model level of water security.

South Asia and parts of Central and West Asia are faring the worst, with rivers under immense strain, while many Pacific Islands suffer from a lack of access to safe piped water and decent sanitation and are highly vulnerable to increasingly severe natural disasters.

By contrast East Asia, which has the highest frequency of hazards in the region, is relatively better off due to higher levels of investment in disaster defenses, but urban water security remains poor in many cities and towns.

The study highlights sharply rising inequality in access to water and sanitation, and the increasingly precarious state of rivers. It presents options for measures that can be adopted to improve water



security to mitigate the growing pressure from booming populations, urbanisation, pollution, overextraction of groundwater, climate change and other factors.

The work also stresses the importance of more productive use of water, including greater recycling of used water. It also sets out a range of other essential actions including corporatising water utilities to improve their efficiency; increasing sanitation investment; encouraging more productive water use by food and energy producers; more regulations on groundwater use; strengthening management of river basins; private sector investment to clean up rivers; and improving disaster risk management.

"Study warns of imminent water crisis", 19/03/2013, online at:

http://www.iwapublishing.com/template.cfm?name=news1511&utm\_source=IWA+Publishing+Mailing+List&utm\_camp aign=cf4b4ff9ec-GND\_19\_March\_2013&utm\_medium=email

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## \* Nigeria: World Bank and FDA finalise water resource management funding

The World Bank and French Development Agency (FDA) have completed plans to establish a joint financing arrangement for irrigation and water resources management in Nigeria, to a total of \$550 million.

A breakdown of the contributions by the international agencies to water development and food security in the country shows that the World Bank will provide \$400 million, and the FDA will tentatively offer \$150 million.

Speaking during the inauguration of a steering committee on Nigeria irrigation and water resources management the minister of water resources, Sarah Ochekpe, said the project would begin immediately.

Works will include irrigation development and management, water resources management and dam operation improvement, project management, monitoring and evaluation.

She added that the fund will be used for studies and preparation activities as well as infrastructure investment in the selected projects, adding that a \$3.5 million project preparation fund has been approved for the studies and design stage which includes grant of \$0.5 million from the FDA.

Mrs Ochekpe added that when the initial project is completed it would add over 52,000ha of land to the existing irrigation area, while also reducing the risk from existing dams.

"Nigeria: World Bank and FDA finalise water resource management funding", 18/03/2013, online at: <u>http://www.iwapublishing.com/template.cfm?name=news1510&utm\_source=IWA+Publishing+Mailing+List&utm\_camp</u> <u>aign=cf4b4ff9ec-GND\_19\_March\_2013&utm\_medium=email</u>

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# \* Can Authoritarian Regimes be Climate Resilient? Not Likely

William Goodyear of the Near East South Asia Center for Strategic Studies at National Defense University <u>recently asked</u> an excellent question in response to something we said in an <u>interview</u> on climate change and Syria. The question is: "Is Climate-proofing a Tool for Dictators?"

To get definitions out of the way, our use of the term "climate-proofing" referred to the practice of ensuring that one's governance structures are able to anticipate and absorb current and projected climatic changes, without significant harm. Mr. Goodyear's concern was that: "pursuing 'climate friendly' governmental policies could be used as tools for keeping dictators and tyrants in power."

That's a very legitimate concern, particularly as authoritarian regimes, past and present, have often deployed half-baked "<u>service provision</u>" strategies for maintaining security and stability, and dulling the appeal of dissent.

However, a number of studies demonstrate that part of "climate-proofing" may involve developing a greater level of participatory governance, and authoritarian regimes obviously do not do so by definition.

For example, evidence suggests that authoritarian regimes are far less resilient (and thus, less climate resilient) than more open or democratic societies, partly because they are generally unaccountable to the needs of their citizens (see<u>Fredriksson and Neumayer's</u> literature review), have high levels of corruption (see <u>Gilley</u>), and are less capable of, or willing to, adapt to rapidly-changing external and internal circumstances that effect their publics.

In the Syrian context, al-Assad's regime, due to its authoritarian nature and general "deafness" to the grievances of the Syrian public, particularly in agricultural areas, seems to have had very little incentive to improve its <u>natural resource management practices</u>, never mind its climate change policies (see<u>Acemoglu and Robinson</u> on the weak incentive structures of such nondemocracies).

And even if authoritarian regimes attempt to maintain continuity and stability by improving their climate change or natural resource management practices, the historical record shows that such "improvements" can only go so far, and that's not nearly as far as democracies can go. This is shored up by the aforementioned Frederiksson and Neumayer study, where the authors state:



Using data classifying countries as democracies and autocracies going as far back as the year 1800, we find that democratic capital has a robust positive effect on national and multi-lateral policies addressing climate change.

Societal inputs in authoritarian regimes are usually so low, and decision-making so potentially (and actually) arbitrary, given the concentration of power and wealth in a very small number of individuals and other factors common in autocracies, that good governance and sustainable natural resource management are rarely the result (<u>Gilley's</u> example of China is a good one). Resilience, in our view, requires a healthy degree of "distributed power" across a populace (see <u>Rafe Sagarin</u>), just as a national energy infrastructure would be more resilient if it had more "distributed energy." It does not follow that more open or democratic societies are always more sustainable or climate resilient, but this evidence suggests that they are generally far better at it. Winston Churchill's <u>famous quote</u> comes to mind...

Based on this evidence, it seems that authoritarian regimes are not climate-proof by their very nature. And our suspicion is that if such regimes attempted to appease their respective publics through trying to improve their climate change policies, they would likely fall short, both because true climateresilience would require healthier levels of citizen participation, and because climate-related problems are clearly not the only ones plaguing such societies.

In other words, "climate-proofing" would surely not be a silver bullet for the al-Assads of the world. Dictators could not use it as a tool for maintaining their viability, unless they were prepared to loosen their own grip on power, and cease to be dictators.

"Can Authoritarian Regimes be Climate Resilient? Not Likely", 19/03/2013, online at: <u>http://climateandsecurity.org/2013/03/19/can-authoritarian-regimes-be-climate-resilient-not-likely/</u>

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## Documentary Looks at Impact of Mekong Dams

PHNOM PENH - An updated documentary, "Where Have All the Fish Gone?," examines the impacts of hydroelectric dams on the Mekong River.

In particular, the film shows construction of the controversial Xayaburi dam, in Laos. The film screened recently at the Australian Center or Education in Phnom Penh.

The Xayaburi dam, which would produce hydropower for market, has become a divisive issue among Mekong River countries. Critics say it could severely damage ecosystems on which lower countries like Cambodia and Vietnam rely. It is one of 11 dams under consideration on the lower Mekong.

Kunthea Phirum, a graduating student in the capital who viewed the film recently, said he had thought such a dam would help improve the economy of Laos, but now he's not so sure.

"After seeing so many negative impacts of the dam, and other available options for generating energy for Laos, I don't think the dam is the best choice for that country," he said.

A previous version of the film screened in Phnom Penh two years ago. It was shot on locations in Cambodia, Laos, Thailand and Vietnam, depicting a number of projects under way and voicing concerns of environmental activists and experts who warn of unpredicted consequences from the dams.

Journalist Tom Fawtrop, who directed the film, said the Xayaburi dam is not likely worth the costs.

"Whatever benefits Laos may gain in selling the electricity are probably outweighed by the enormous destruction this will be to the Mekong River and its ecosystem and jeopardizing food security of all the nations of the Mekong," he said.

Some 60 million people live along the Mekong River, relying on it for food and agriculture. The use of the river is supposed to be supervised by the Mekong River Commission, which has representatives from regional governments.

Gordon Congdon, freshwater conservation manager for the World Wildlife Fund, said the film raises serious questions about the effectiveness of the commission. Many of the impacts of the Xayaburi dam have not been carefully considered, he said.

"At this point, it's premature—and frankly I think it's irresponsible—to proceed with the construction of the dam before these important questions are answered," he said.



Cambodia and Vietnam has both called for further impact studies before the dam is built. But media have reported the ongoing construction of the dam, with the permission of Laos.

Chhit Sam Ath, executive director of the NGO Forum, said this kind of behavior is ultimately bad for people living downstream.

"If each country thinks only of its own benefits, then in the end the people are the ones who pay the costs," he said. "We share the same river."

"Documentary Looks at Impact of Mekong Dams",22/03/2013, online at: http://www.voacambodia.com/content/documentary-looks-at-impact-of-mekong-dams/1626779.html

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# \* Fish Passages A Poor Match for Mekong Dams' Impacts

The start of construction of the <u>Xayaburi Dam</u> on the<u>Mekong River</u> in Laos sets off a dangerous game of Russian roulette with the world's largest inland fishery.

As the first project in a cascade of 11 hydropower dams to be built on the Lower Mekong River's mainstream, the dam is expected to block the migration route of between 23 and 100 fish species, while adversely impacting the livelihoods and food security of more than 200,000 people. The dam's proponents claim that a state-of-the-art fish ladder, designed by the Finnish and Swiss companies Pöyry and Terraplant, will allow migrating fish to safely pass through the dam.

Yet fishery experts in the Mekong region have challenged this claim, stating that no technology currently exists to effectively mitigate the impacts caused by the mainstream dams due to the wide diversity of migrating fish species and the large numbers of fish that migrate at peak times. A 2011 scientific study published in *Environmental Management* warned that a serious effort to minimize impacts from the mainstream dams would take decades of research on the biological requirements of key migratory species to ensure that specialized fish passage facilities actually meet the needs of this diverse fishery .

In its <u>2011 review of Pöyry's work</u>, the Mekong River Commission recommended a lessconservative plan, stating that construction on the Xayaburi Dam be delayed at least two years, so that fishery baseline data could be collected, analyzed and incorporated into the final design of the dam.

Instead of heeding the recommendations of these experts, Laos has continued to move forward with construction, with the project's coffer dam expected to be completed as early as May.

Yet if any lessons are to be drawn from the experience of dam building in the Mekong River Basin, it's that fish passages offer false promises. In the nearby Mun River, an important tributary of the Mekong, the <u>Pak Mun Dam's</u>fish passage has been viewed by experts as a total failure, as less than a quarter of the river's fish species successfully pass through the passage.

In a <u>2001 review of the failures of the Pak Mun Dam's fish passage</u>, fishery expert Tyson R. Roberts warned that solving the problem of dams creating a barrier to fish migration is only the first step in attempting to mitigate the impacts of dams on fisheries. Roberts cautioned: "What use is a fish ladder ... enabling fish to move from one extremely unfavorable set of environmental conditions downstream (in the reservoir outflow) to a totally different but also unfavorable set of environmental conditions upstream (in the reservoir)?"



The reality is, there are no successful examples of fish passages in the region to draw from, nor even in another tropical country. With so much at stake for the Mekong River's fisheries and its people, the game of Russian roulette on the Xayaburi Dam must stop. Construction on the project should be halted until proven solutions are put forward to protect the Mekong's abundant fisheries from the impacts of the mainstream dams.

"Fish Passages A Poor Match for Mekong Dams' Impacts", 19/03/2013,online at: <u>http://www.internationalrivers.org/resources/fish-passages-a-poor-match-for-mekong-dams%E2%80%99-impacts-7887</u>

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# Report: UN Proposes a Common Definition for Water Security on World Water Day 2013

Water security should have a common language, and it should be a priority for global sustainable development goals, according to a new report by UN-Water.

In <u>a report released today to mark World Water Day</u> and 2013 as the International Year of Water Cooperation, UN-Water is proposing a common definition of water security. UN-Water, which coordinates water programs within the United Nations system, claims that a single description of the problem will help global collaboration around water, one of the world's most vital needs.

The authors define water security as: "The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development; for ensuring protection against water-borne pollution and water-related disasters; and for preserving ecosystems in a climate of peace and political stability."

At least 17 organizations affiliated with UN-Water contributed to the paper. Most contributors are United Nations agencies, but others include the International Association for Water Law, the International Union for the Conservation of Nature, the Stockholm International Water Institute, and the World Wide Fund for Nature (WWF).

"Common understanding has central importance in international discussions, and water security can't continue to have a variety of meanings," said Zafar Adeel in a statement. Adeel, who contributed to the report, is the co-chair of the UN-Water Task Force on Water Security and director of the Ontario-based Institute for Water, Environment, and Health.

"A shared and working definition is needed to get everyone on the same page," Adeel said. "Only then can we collectively start to write a coherent response to the challenges."

# Words Into Action

In recent years, water has attracted some prominent advocates who want the world's leaders to take notice. Last September, the InterAction Council, a public-policy group of 40 former heads of state and government, <u>encouraged the UN Security Council to address water scarcity</u>.



The report was followed later that month by a roundtable discussion of water security during the United Nations General Assembly meeting in New York. The General Assembly <u>declared water and sanitation a human right</u> after a vote in 2010.

A few months earlier, former U.S. Secretary of State Hilary Clinton ordered <u>the first cabinet-level</u> <u>assessment of global water security</u>.

"You can't work on water as a health concern independently from water as an agricultural concern," Clinton said a year ago, during a World Water Day event in Washington, D.C. "And water that is needed for agriculture may also be water that is needed for energy production. So we need to be looking for interventions that work on multiple levels simultaneously and help us focus on systemic responses."

Some water advocates are hoping that the water security definition newly proposed by UN-Water leads to action, rather than introspection.

"Every definition results in more debate on the definition instead of focusing on the problem, which is access to water," said John Hartley, CEO of Future Directions International, a nonprofit institute in Western Australia that does research on food and water. Hartley told Circle of Blue that the definition is important and nearly all encompassing, but that food security needs to be considered alongside water.

Patricia Wouters agreed that results matter more than the particular definition, especially if that definition is in a policy document, rather than a legal agreement. Wouters, who reviewed a draft copy of the report, is a professor of international law at the UNESCO Center for Water Law, Policy, and Science at the University of Dundee, Scotland.

"I'm not bothered by the breadth or the multitude of issues," Wouters told Circle of Blue. "I'm happy that the UN is grappling with this."

Precision will come into play in the next few years. Food and water, as well as sanitation, are <u>drawing attention</u> as the United Nations prepares to write a new agenda for social and economic well-being. The Millennium Development Goals (MDGs), which came into effect at the turn of the



century, expire in 2015. The United Nations announced last year that the MDG for water was attained, but the sanitation target will not be met.

Today's UN-Water report calls for the still-evolving sustainable development goals to include a numerical target for water security. The report argues that water security — because of the broad definition — is something of an umbrella goal. In other words, if water is adequately addressed, success will cover other areas such as health, nutrition, environmental protection, and employment.

"It is safe to state that investment in water security is a long-term pay-off for human development and economic growth, with immediate visible short-term gains," the report states.

"Report: UN Proposes a Common Definition for Water Security on World Water Day 2013", 22/03/2013, online at: http://www.circleofblue.org/waternews/2013/world/un-agency-proposes-a-common-definition-for-water-security/

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# \* Hong Kong's unsustainable water policies

Mayling Chan says complacency has led Hong Kong to rely too much on water from the Dongjiang itself facing increasing stresses - while failing to push for better conservation measures and seek alternative sources

Interdependence is a human condition while total dependence is not sustainable in the long run. The Dongjiang, or East River, is part of the extensive river system of southern China, together with the Xijiang (West River) and the Beijiang (North River). These water sources are valuable assets of the Pearl River Delta.

The water from the Dongjiang sustains more than 40 million people in the cities of Heyuan, Huizhou, Dongguan, Guangzhou, Shenzhen and Hong Kong. There is no reason why a sustainable water policy could not be a shared objective. Although we do not share the same system or procedures of managing potable water, authorities on both sides of the border must at least share principles and best practices on preserving water sources and improving water quality.

Globally, 780 million people - or one in nine of the world's population - lack access to a safe water source. This includes the 119 million in China who, according to the World Health Organisation, did not have access in 2010. Given that Macau and Hong Kong residents enjoy safe drinking water from their taps while those in Zhuhai and Shenzhen do not, there is an obvious gap in managing, monitoring and reporting on water quality.

The thousands of pig carcasses found in the waterways of Shanghai and Jiaxing recently raised worries about the water quality and food safety, and became a public health scare. Repeated scandals such as this do not help to build trust in official water quality standards.

China has yet to adopt the stringent standards of many developed nations. People mistrust official data that emphasises that things are "normal" even when the seriousness of a situation isn't fully known. So far, no city in China can say its water is safe to drink straight from the tap. One solution is to seek verification from a third party to enhance credibility and win back trust by disclosing information.

Macau's water company is quoted in the Chinese media as an example for the rest of China to follow, Hong Kong included.

During the National People's Congress meeting, many representatives warned that, for growth to continue, people need clean air and water.

Given the seemingly frequent incidents of water contamination all over the country, many people might be unaware of Beijing's determination to manage water sustainably. Earlier this year, the State Council announced a stringent three-part water management system for the nation: control of the total volume for use; control of water use efficiency; and, control of water quality compliance in important rivers and lakes.



Guangdong's target for total water use has been set at 45.7 billion cubic metres for 2015, and by 2030, 45 billion cubic metres, despite the growing demand from agriculture and for potable drinking water (including for Hong Kong).

This sends the right signal to Hong Kong about our dependency on the Dongjiang, which over the past 10 years has provided between 70 and 80 per cent of our needs. The government predicts that, by 2030, our water needs will reach 1.3 billion cubic metres, a 40 per cent increase from our total water use last year.

Although it seems we have no immediate crisis, there are worrying signs about the Dongjiang water source. The Guangdong government's report on its water in 2011 showed that the average quantity of water in the Dongjiang Basin each year between 2002 and 2011 was 30 per cent less than the historical average for the past 50 years.

The Guangdong government will have a tough mission on quality control, too. The Dongjiang's water quality has been declining, and compares badly with the other two main tributaries of the Xijiang and Beijiang.

Although many factories have been relocated away from the centre of Guangdong, the Heyuan city region, the catchment area in the upper part of the Dongjiang, is experiencing a drastic increase in heavy industry. The immediate consequence is the threat of contamination through illegal discharge of toxic materials into waterways.

Here in Hong Kong, we still lack a progressive plan with sustainable strategies and a firm set of targets. In urban areas, we rely on demand management, efficient systems, waste water conversion, and rainwater and storm water collection. Our water leakage rate in 2011 was 19 per cent, while in South Korea it was 12 per cent; in Singapore, 6 per cent; Japan, 3.6 per cent. Investing in fixing our pipes could save taxpayers a substantial amount, given that each cubic metre of water costs HK\$8.

Grey water use in Hong Kong is not sufficiently discussed in public. Since the 1960s, Japan's grey water system has had targets for reducing freshwater use in flushing toilets, and for grey water to be used for landscaping and recreational purposes. In 2002, Singapore set up its NEWater initiative to meet needs, with targets to reduce total water use, focusing on treating waste water from kitchens and bathrooms. The Singapore government believes waste water treatment is more cost-effective than desalination.

Hong Kong Financial Secretary John Tsang Chun-wah announced in his recent budget a plan for a seawater desalination plant in Tseung Kwan O, which is estimated to produce about 50 million cubic metres of water. Per cubic metre, the cost is HK\$4 more than the purchase of Dongjiang water.

And it will relieve our dependence on Dongjiang water by only a small margin - around 5 per cent of our total consumption last year. While the government argues that it is urgently needed, the public is asking whether this is the best water management strategy. Non-governmental organisations and think tanks want very different priorities: grey water systems in all the new buildings to start with, plus a pledge for substantial investment to fix leaks, coupled with better demand-side management.



A day like World Water Day, today, is an opportune time to contemplate why despite constant stories about the world facing a water crisis, we never feel that pressure in Hong Kong.

"Hong Kong's unsustainable water policies", 22/03/2013, online at: <u>http://www.scmp.com/comment/insight-opinion/article/1196453/hong-kongs-unsustainable-water-policies</u>

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