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***** Iran to resolve its water shortage through a new national water conservation plan

Iranian President Hassan Rohani, who began his term in office on Aug. 3, 2013, said he would put the protection of Lake Urmia at the top of his agenda during the election campaign. After his election, Rohani established a working group headed by Iran's energy minister on Aug. 19 to save Lake Urmia. As a matter of fact, the drying up of Lake Urmia has also highlighted the water shortage in Iran, especially in recent years.

The water shortage in Iran is directly related to its dense population and mismanagement of water resources as well as current climatic conditions. At a meeting of Iran's High Council for Water held on Oct. 29, President Rohani stated that a national water conservation plan must be drawn up for the conservation and efficient use of water. Other issues discussed at the meeting, which was attended by ministers and high-ranking officials, were as follows: Tap water in the large cities of Mashhad and Isfahan; the water quality of the Karun River, which has recently seen disputes over the dams planned to be built there; and the issue of the Gotvand Dam, an embankment dam on the Karun River in Khuzestan, which was inaugurated in 2013 and whose second phase is projected to be completed in 2015, after which it will become Iran's highest earth-filled dam.

At the meeting Rohani said Iran's water shortage must be resolved through national will and that all relevant institutions and bureaucrats must participate in the process.

Furthermore, Rohani went on to say that legislation regarding water must be approved and any violation of the law should be dealt with. Also, the involvement of NGOs and users in the management of water resources could support these changes.

As for the main reasons for the water shortage in Iran, while the average annual rainfall of Iran, where a semi-arid and arid climate prevails, is one-third of the world average, the evaporation rate is three times above the world average. The expansion of cities due to immigration and developments in the agricultural and industrial sectors lead to problems in the demand for potable water and also other uses of water. The expansion of cities, as well as population growth, particularly increases the demand for potable water and water to be used in agricultural irrigation and the industrial sector. Dams and water conduits are constructed to generate electricity, avoid flooding and for irrigation, while an amount of water above the safe level is drawn from groundwater resources to meet water



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demand, and water is redirected to meet the water needs of basins that are drier and more densely populated. It has already been stated that the projects Iran has carried out to meet its water demand will remain insufficient and that Iran needs to restructure its water management. Iran is more likely to be successful after these latest developments and especially after Rohani put the water issue at the top of his agenda.

"Iran to resolve its water shortage through a new national water conservation plan", Tuğba Evrim Maden, Today's Zaman, 10/11/2013, online at: <u>http://www.todayszaman.com/news-331011-iran-to-resolve-its-water-shortage-through-a-new-national-water-conservation-plan.html</u>

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***** Official: Iran Self-Sufficient in Dam Construction, Water Industry

TEHRAN (Tasnim) – Iran is self-sufficient in dam construction, and produces an extensive range of equipment and facilities used in water-related industries, managing director of Iranian Water Resources Management Company said Saturda

Mohammad Hajrasouliha who was speaking on the last day of the 9th Iran International Water & Wastewater Exhibition (WATEX) said that the achievements in these two fields were made in the face of financial restrictions and tough sanctions.

He referred to capabilities of Iranian experts and companies in dam construction and other related sectors, but said that export of technical-engineering services is still low, and that Iran has no presence in many countries in such fields.

The increased population growth trend in the region and lingering draught deteriorates the tight situation of water supply and serious development plans in the sector has become an undeniable requirement in Iran.

The rapid pace of development in the water sector in Iran has provided an open stage for all those willing to invest in this sector.

To provide up to date information to the investors and in order to facilitate their access to the relevant private or state owned organizations active in this field, the first round of the biannual International Water & Wastewater Exhibition (WATEX) in Iran was held in November 2000.

The 9th Iran international water & wastewater Exhibition which focuses exclusively on the water and wastewater industry is being held from 6-9 November in Tehran's International Permanent Fairground.

In recent years, Iran has been one of the leading countries in terms of the construction of dams. It is the top country in the region and the third in the world in the sector of dam construction. Iran's success in this field has largely been driven by its arid climate and its growing need for water resources.



Iran is located in one of the most arid regions of the world and its average annual precipitation is 252 millimeters. This figure is just a fourth of the world's average precipitation.

While Iran has been building dozens of dams across the country, it has increasingly looked to the external market. It has dam construction projects in Tajikistan, in Kyrgyzstan and in neighboring Azerbaijan and Armenia. More recently, Iran has begun to develop dams further afield, for example, in Nicaragua and Ecuador.

"Official: Iran Self-Sufficient in Dam Construction, Water Industry", 09/11/2013, online at: http://www.tasnimnews.com/english/Home/Single/188298

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* Column: An Iran Nuclear Agreement Could Help Afghanistan and South Asia

More is riding on negotiations in Geneva than just the world's desire to keep Iran from building nuclear weapons.

An agreement between Iran, the United States and the other permanent members of the U.N. Security Council plus Germany could substantially improve the atmosphere for Iranian cooperation on regional issues, especially the upcoming major U.S. and NATO withdrawal from Afghanistan, according to experts who<u>spoke Friday at the Atlantic Council</u>, a Washington think tank.

Iran has played a key role in the affairs of its eastern neighbor for centuries, going back to the days when western Afghanistan was part of the Persian Empire. A decade ago, Iran worked with the United States to overturn the Taliban, but more recently it has assisted some anti-American Taliban commanders to hedge against the possibility of a U.S. or Israeli attack on Iran over its nuclear program. Defusing the nuclear crisis would diminish Iran's incentives to continue such hedging behavior, says Barnett Rubin, an Afghan specialist who directs the Center on International Cooperation of New York University and recently left a position as senior adviser to the special representative for Afghanistan and Pakistan at the U.S. State Department.

"If there is significant progress on the nuclear file, it will create space for talks on Afghanistan," Rubin said Friday. The U.S. and Iran have "many common interests" in Afghanistan but the Iranians want to be sure that any residual U.S. military presence after 2014 is not a threat to them, he added.

The Obama administration could also improve the outlook for Afghan stability by working with Afghanistan, Iran and Pakistan to resolve regional sources of instability, including scarce and poorly managed water resources, energy shortages, ethnic insurgencies and drug trafficking.

According <u>a new report released Friday</u> by the Atlantic Council written by Fatemeh Aman and this reporter, one of the key issues dividing Iran and Afghanistan is disagreement over the Helmand River. A 1973 agreement to share the water – which irrigates Afghanistan's Kandahar, Helmand,



and Nimruz provinces and Iran's province of Sistan-Baluchistan – was never ratified or fully implemented. The Afghan government has at times cut off Iranian access to the water by closing the sluices to the Kajaki dam, while climate change has exacerbated prolonged droughts that threatens the residents of Sistan-Baluchistan and the Hamoun basin, a major haven for wildlife on the Iran-Afghanistan border. Iranians charge that Afghanistan uses water that should flow to them to irrigate poppy crops while Afghan authorities accuse Iranians of digging illegal wells near the Iran-Afghan border.

Two U.S. researchers, Laura Jean Palmer-Moloney and Kea U. Duckenfield, recommend setting up a commission to manage water issues to include Iran and Afghanistan plus representatives of U.S., European, and U.N. development agencies. The commission would help Afghanistan better measure annual water flows from the Helmand and use its portion of the water more sustainably. They write in a new paper also cited by the Atlantic Council that "competent handling of water concerns in the Sistan Basin could encourage closer cooperation with Iran on stability and development in Afghanistan and potentially create a framework for U.S. cooperation with Iran."

The United States could contribute to regional stability by changing its views on two other issues: the use of Iran's Chabahar port and the fate of the so-called "peace pipeline" meant to provide Iranian natural gas to energy-starved Pakistan and eventually to India as well. U.S. sanctions against Iran because of its nuclear program have inhibited wider use of Chabahar as a conduit for trade to and from Afghanistan, Central Asia and India. Meanwhile, Pakistan has cited U.S. sanctions as a reason not to complete its portion of the peace pipeline. Instead, the U.S. has backed the so-called TAPI pipeline to send Turkmen gas through Afghanistan to Pakistan and India. That project is even farther from completion.

Aman, a specialist on Iran and South Asia, said that the pipeline still makes sense for Iran and Pakistan despite recent threats by leaders in both countries to cancel the project. "The Pakistanis are waiting to see how it goes with the nuclear negotiations," she said.

Should the nuclear talks go well, the Obama administration could give Pakistan a green light to construct its section of the pipeline and even provide financial assistance. Such a change in U.S.



policy would benefit Iran and improve U.S. relations with Pakistan, recently strained again by a drone attack that killed the head of the Pakistani Taliban.

The U.S., Iran, Afghanistan and Pakistan also have a mutual interest in curbing the drug trade, which supports organized crime and extremist groups including ethnic insurgents who menace all three countries. Here the water issue comes in again as, Aman noted, better management of the Helmand River would make it easier for Afghan farmers to diversify away from poppy, which grows well even in drought conditions.

According to Rubin, the historic U.S. animus toward Iran and vice-versa has skewed policy toward Afghanistan and South Asia to the detriment of the region. Because of its close ties with numerous Afghan political actors, Iran will be heavily involved in next year's Afghan elections and the formation of a new post-Hamid Karzai government, Rubin said.

"If the U.S. and Iran are not speaking, it will be harder," he said. If relations improve, Iran "can play a positive role" in shoring up stability in a country in which the United States has poured immense blood and treasure over the past 12 years.

"Column: An Iran Nuclear Agreement Could Help Afghanistan and South Asia", 08/11/2013, online at: <u>http://www.voanews.com/content/barbara-slavin-iran-nuclear-deal-would-help-afghanistan-south-asia/1786614.html</u>

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* After Drought, Israel Faces Water Surplus

Earlier this year, following a winter of good rainfall, Israel's Water Authority<u>declared that the crippling seven-year drought had come to an end</u>. Nevertheless, officials continued to caution water conservation. Now, it would appear Israel might have too much water.

With another winter of predicted average-to-good rainfall ahead, Water Authority officials believe the Kinneret (Sea of Galilee) could overfill.

So concerned are they by this possibility that two weeks ago the Water Authority tested the Degania Dam that sends water from the Kinneret into the Jordan River. The dam had not been opened since the winter of 1992, when Israel received nearly double the average annual rainfall.

While this might sound more like a blessing than a problem, government officials are concerned about what it will mean for the newly opened desalination plants along Israel's Mediterranean coast.

In short, the plants will be asked to produce less water this year than they are able to provide. And that means smaller profits. All of this was built into the state's contracts with the desalination plants, but that doesn't mean everyone is happy with the situation.

Regardless, Water Authority officials told Israel's *Globes* newspaper that the desalination plants were established as a kind of fail-safe to keep Israel from drying up in future droughts. And, <u>according to experts</u>, an even more severe drought than the previous is expected to hit the region in 2015, or shortly thereafter.

"Even if the plants don't work at full capacity in the coming year, we will soon definitely need their output," said Water Authority officials. "The Israeli economy has a structural water shortage, and one rainy year does create a new reality."

In the meantime, the Israeli taxpayers will pay the desalination plants an estimated 160 million shekels (\$45 million dollars) for clean water not produced.

As difficult as that prospect might sound, "it is cheaper to pump water from natural sources than to buy water from the desalination plants at full rates," concluded the Water Authority.

"After Drought, Israel Faces Water Surplus", 06/11/2013, online at: <u>http://www.israeltoday.co.il/Default.aspx?tabid=178&nid=24229</u>

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✤ Jordan's desalination project advances

Plans to build a new desalination plant on the Gulf of Aqaba are moving forward. While critics argue that the \$1bn project, which aims to address a chronic water shortage and save the shrinking Dead Sea, is expensive and potentially damaging, advocates insist the need to proceed couldn't be clearer. Freshwater produced by the new facility would be piped to users in adjacent areas of Jordan, Israel, and the West Bank; in return, Israel would increase the amount of water it sells to Jordan from the Sea of Galilee, which is closer to Amman and other population centres in the kingdom's north. In addition, some or all of the brine – the high-salt concentrate left over from the desalination process – would be piped some 200 kilometres north to help replenish the Dead Sea, the level of which has been dropping by as much as a metre per year.

The planned size and scope of the project have varied over the years, as have the nature and extent of the role(s) to be played by Israel and/or Palestine, but following completion of a World Bank feasibility study, the cabinet announced in August that it had decided to start with a single plant with an output of 85m-100m cu meters per year. Jordanian officials say they expect grants from foreign governments and/or multilateral institutions to cover \$300m-400m of the costs involved, and that while water bought from Israel will be priced at about \$0.42 per cu metre, the Israelis will have to pay \$1.40 or so for the supplies they receive. Finally, in addition to opening up thousands of hectares of land to irrigated farming, the plant is expected to provide between 400 and 500 well-paying jobs for local residents.

Some environmental groups have spent years trying to block the venture, arguing – among other things – that conservation has never been given a chance to either cure water shortages or reverse the shrinking of the Dead Sea. The only way to start restoring the latter's natural balance, they say, is for Israel to sharply reduce the amount of water it collects from the Jordan River Basin, including the Sea of Galilee; the amount of water the Jordan carries into the Dead Sea and its basin, they note, is estimated at less than 10% of what it was a century ago.

The same critics warn that while the aforementioned brine may temporarily slow or even reverse falling water levels in the Dead Sea, it also will irreversibly alter the latter's appearance and chemical composition, reducing the value of its contents for cosmetics, tourism and even industry. They also argue that the added expense of the brine scheme will make the desalinated water four times more expensive than competing products elsewhere in the region. Alternatively, they fear that if the first desalination plant is a success, the government will make good on follow-on plans to build four or five new and larger ones, and to power them with nuclear energy.

Advocates of the plan say they have nothing against conservation but that Jordan is in no position to either impose it on the Israelis - or, as the fourth-driest country on the plant, to wait any longer for



more water. Years of talks with both Israel and the Palestinian National Authority have already brought lengthy delays, and the influx of refugees fleeing Syria's civil war is putting added pressure on water resources, making the need for action more urgent. As for the cost of the water to be produced, they predict that higher expenses associated with the brine will dwindle to insignificance in the long term, particularly when planned expansions of desalination capacity achieve greater economies of scale. They also cite assurances from project engineers that the brine will be piped in deep below the surface of the Dead Sea and remain there, never mixing with the water at the surface.

Jordanian officials say their people, their farms and their industries need the water now, arguing in effect that to change course at this stage would be to forsake a practical, achievable good for a theoretical perfection that has yet to be defined. They also staunchly defend the nuclear strategy, which, along with extensive shale gas reserves, would finally end the kingdom's need to import virtually all of its energy requirements.

The government is banking on these and other mega-projects, including shale oil- and wind-powered power plants and a new pipeline carrying Iraqi oil, to fuel a national economic revival. In addition to the incomes and spin-off effects to be generated by their own construction and operation, the hope is that expanded water and energy sectors will take other industries and the economy as a whole to another level of development – and keep them there.

"Jordan's desalination project advances", 06/11/2013, online at: <u>http://www.oxfordbusinessgroup.com/economic_updates/jordan%E2%80%99s-desalination-project-advances</u>

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* Report: Israeli peace negotiators Livni and Molcho in conflict over Jerusalem

During recent peace talk discussions, Justice Minister Tzipi Livni, who heads the Israeli negotiations team and Prime Minister Binyamin Netanyahu's representative, Yitzhak Molcho, came to loggerheads on issues relating to the size of the area designated for the free movement of Israelis and Palestinians in Jerusalem, Israel Radio reported on Tuesday.

According to the report, Molcho asked to restrict the boundaries as much as possible, bordering on east Jerusalem, while Livni showed a more flexible stance.

Israel's opening position on the borders is the actual path of the separation barrier rather than the pre-1967 lines as demanded by the Palestinians, Israel Radio reported.

Israel wishes to retain not only the settlement blocs, but also some isolated settlements beyond the barrier, such as Psagot and Beit-El, the report added.

Israel has also stated that it will keep its hold on the Jordan Valley and its water resources, but Palestinians will be allowed to purchase water from Israel.

To date, the negotiating teams have held fifteen meetings, each of which lasted 3-4 hours. US negotiator Martin Indyk recently joined the table, and is actively attending the latter part of the meetings, according to the report.

Sources at the <u>Prime Minister's Office</u> deny the issue concerning the borders, and added that it has been made clear to the Palestinians that Jerusalem will remain under Israeli sovereignty with its present borders.

Livni's office offered no comment, but stated that the the report was unfounded and meant to harm negotiations. The office added that Livni and Molcho were working in full collaboration.

The report came as US Secretary of <u>State John Kerry was due to arrive on Tuesday</u> to visit Israel and the Palestinian territories, and to advance the Israeli-Palestinian peace process.

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[&]quot;Report: Israeli peace negotiators Livni and Molcho in conflict over Jerusalem", 11/05/2013, online at: <u>http://www.jpost.com/Diplomacy-and-Politics/Report-Israeli-peace-negotiators-Livni-and-Molcho-in-conflict-over-Jerusalem-330646</u>



* Israel To Build Wall In Jordan valley

Israeli Prime Minister Benjamin Netanyahu decided to build a wall in the Jordan valet, on the border between the occupied West Bank and Jordan. The decision was met with rejection and condemnation from the Palestinian Authority in the West Bank.

According to Israeli sources, Netanyahu wants to build the Wall to prevent Syrian refugees from entering the occupied West bank through its border area with Jordan.

Netanyahu also wants to ensure a continued construction and expansion of illegal settlements in the Jordan Valley area, and said that Israel does not intend to withdraw from the area under any agreement with the Palestinians.

Nabil Abu Rodeina Spokesperson of Palestinian President Mahmoud Abbas stated that the statements and decisions of Netanyahu to build this illegal wall in the Jordan Valley are meant to foil the chances of success of the upcoming visit of U.S. Secretary of State John Kerry, and the political process.

"Settlements are illegal, illegitimate and the Wall will fall", Abu Rodeina said, "Without an independent state, without Jerusalem as the capital, there will be no peace or stability in the region".

He further stated that borders are one of the core issues that have not been resolved, and determining those borders only takes place in peace talks, not through illegitimate unilateral decisions.

Israel claims it wants direct talks without preconditions, and that it is interested in peace with the Palestinians but refuses to recognize the legitimate Palestinian rights of statehood, sovereignty and independence.

It continues to isolate the Jordan Valley, devastating the entire Palestinian economy, and continues to build and expand its illegal settlements in the occupied territories, including the Jordan Valley and occupied East Jerusalem, on the expense of the Palestinians and their lands.



Tel Aviv wants to maintain control over borders, natural resources, and all sensitive areas in the occupied West Bank, including occupied Jerusalem.

Villages in different parts of the West Bank lost large areas of their lands due to the illegal Annexation Wall and Israel's illegal settlement construction and expansion activities that left the Palestinian communities devastated and isolated from what is left of their lands.

Jericho, Nablus and Tubas are amongst the most impacted areas by Israel's illegal policies and settlement activities.

Rich in water resources but suffer a sharp shortage of water as Israel controls all water resources, and grants them to its illegal settlements and military bases.

"Israel To Build Wall In Jordan valley", 03/11/2013, online at: http://www.imemc.org/article/66352

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* Israeli start-ups set to make a splash in UK, again

Dozens of companies from Israel will attend a major conference in London, where top investors and executives will take a closer look at their technologies

London doesn't lack a start-up scene, but that won't stop the city from importing dozens of Israeli start-ups for the second annual<u>Innovate Israel</u>, the largest Israel business conference outside of the Holy Land. This year's event promises to be even bigger than last year's, with over 500 attendees expected at the one-day event on December 4. Attendees representing some of Europe's largest companies and investment houses, along with government and tech industry figures, will hear from senior figures from companies like Facebook, Microsoft, Google and Virgin.

Sponsors include W residence and hotel developers, British Telecom, Bank Pictet, executive search and networking firm The Up Group, accounting firm Mazars, and Orange Telecom. Among the speakers at Innovate Israel will be Nathalie Boulanger, director of Orange Startup Ecosystem, a part of the worldwide Orange Group (not to be confused with Orange Israel, which is run by an Israeli licensee of Orange). Speaking to The Times of Israel, Boulanger said Israel was one of her group's most important sources for start-up innovation.

"Israel is very special," she said. "We work with start-ups all over the world, but we have found many innovative ideas and companies in Israel. With 5,000 start-ups, more per capita than anywhere else, we have found some wonderful companies to form partnerships with."

One of those, Boulanger said, was Waze. "Now they have been acquired by Google, but we worked with them extensively" before the buyout, she said.

Orange is interested in a wide range of Israeli technologies, Boulanger said. "Security is an area many Israeli start-ups specialize in," she said. "We also work extensively with Israeli start-ups in video and TV."

Orange several years ago acquired Orca (now Viaccess-Orca), a company that develops services for mobile TV. "A new service they are developing, for example, will allow viewers to synchronize content between two screens, like a phone and a tablet." That's the kind of innovation that will help Orange, Boulanger said, and it's the kind of thing the company finds in Israel.

It's not just tech start-ups that UK companies are interested in. Several weeks ago, a delegation of 17 top executives in the UK water industry were in Israel to explore new technologies in waste treatment, water desalination, water reclamation, and other environmental areas. Among the British companies visiting WaTec, the water and environmental technology show in Tel Aviv held in mid-October, were, among others, United Utilities, Arup, Bloomberg New Energy Finance, British Water,



and food giant Unilever, said Yoni Dolgin, Cleantech Manager at UK Israel Tech Hub at the British Embassy in Tel Aviv. "Israel is a world leader in desalination, wastewater and IT management of water networks, so of course UK and European countries in general are interested in working with Israel."

Enhancing business ties between Israel and the UK is the job of the UK Israel Tech Hub, said Hub director Naomi Krieger Carmy.

"Our focus is promoting commercial partnership, to make connections and show Israeli companies opportunities in the UK," she said. "We have been working with start-ups and large companies in a number of programs. There are incredible partnership opportunities for companies on both sides. Israeli innovation can 'go global' via Europe's business capital, and British companies can gain a global advantage by tapping into Israel's tech ecosystem."

Co-chaired by Marc Worth and Yossi Vardi, Innovate Israel 2013 will be produced by global publishing and events company AcreWhite in partnership with the UK Israel Business chambers of commerce. Daniel Seal, CEO of AcreWhite said, "We have a dynamic range of companies enrolled with just a few spots left. We are delighted to welcome Orange, BT and JT especially, as indication of the serious consideration being given to Israeli technologies by these major corporations."

Co-chair and serial entrepreneur, Yossi Vardi, said "Israel produces the highest rate of start-ups and new technologies per capita than any other country. In a country with a population of less than 8 million, it is logical that any company with aspirations of growth must look to expand abroad."

"Israeli start-ups set to make a splash in UK, again", 04/11/2013, online at: <u>http://www.timesofisrael.com/israeli-start-ups-set-to-make-a-splash-in-uk-again/</u>

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Disi project now operating at 90% of capacity

AMMAN – The Ministry of Water and Irrigation on Tuesday raised the pumping capacity of the Disi Water Conveyance Project by 20 per cent, according to government officials.

The project now operates at 90 per cent of its total pumping capacity of 100 million cubic metres (mcm) per year, Minister of Water and Irrigation Hazem Nasser said.

A series of chemical, physical and biological lab tests have carried out to examine the quality of the water and the safety of the conveyance pipeline, Nasser said in a statement e-mailed to The Jordan Times.

"All tests showed that the water is in line with local drinking water standards and the conveyance pipeline is efficient after raising the project's pumping capacity," the minister noted.

The Disi project, which was launched on July 10, now pumps 90mcm per year to Amman and other governorates and "will reach its maximum capacity soon," a source at GAMA, the Turkish company which implemented the project and is operating it, told The Jordan Times.

In the statement, the minister underscored that the additional amount of water will further improve the water supply in the capital and Russeifa, as well as the Zarqa and Balqa governorates, noting that Amman residents currently receive 60-62 pumping hours per week.

Carried out on a build-operate-transfer, the project entailed the construction of a 325-kilometre pipeline to convey water from the ancient Disi aquifer in southern Jordan to the capital.

The water is being transferred to Amman via the pipeline, which passes through several water stations in Maan, Tafileh, Karak and Madaba.

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[&]quot;Disi project now operating at 90% of capacity", Jordan Times, 06/11/2013, online at: http://mideastenvironment.apps01.yorku.ca/?p=7705



Court rejects suit of 50 Kishon River fishermen who blame their illnesses on pollution

Haifa District Court Judge Ron Shapira rejected Sunday morning a suit filed by 50 fishermen against two companies that have polluted the Kishon estuary: Haifa Chemicals and Fertilizers & Chemicals.

The fishermen claimed that the Kishon River's polluted water was the reason for various diseases from which they are suffering.

The court ruled that it could not find any causal connection between the fishermen's illnesses and their exposure to the carcinogenic materials that had been poured into the river.

The verdict is very much like the one handed down by this same court four months ago when it rejected a similar suit brought by 70 navy divers who had served in the Israel Defense Forces and had dived in the Kishon River as part of their military service.

Regarding the fishermen's claims, Judge Shapira wrote in his verdict that "it has become apparent that, in effect, some of this distinguished dispute did not warrant any verification, because the factual infrastructure on which the arguments [of the plaintiffs] were based as far as the scientific facts were concerned has been shown to be flimsy, to put it mildly."

The court also ruled that "whereas the Kishon River's water was polluted during certain periods by the flow of raw industrial sewage that included highly toxic materials, the plaintiffs failed to prove that their illnesses were caused as a result of their exposure to the Kishon River's water, if they were in fact exposed to it and for any extended period of time."

The fishermen, who had worked in the Kishon estuary for 30 years from the 1970s onwards, filed their suits between 2001 and 2005. They decided to sue the two companies in the wake of reports about the suits filed by the former soldiers and the work of the commission headed by former Supreme Court president Justice Meir Shamgar that investigated the connection between the Kishon River's pollution and the navy divers' health problems.

The second group of divers filed their suit in 2000 following the commission's appointment in the wake of the struggle waged by the first group of navy divers. The Shamgar Commission was,



however, unable to find any direct connection between the Kishon's pollution and the divers' illnesses. Nonetheless, the minority opinion of Justice (ret.) Shamgar did find a causal connection between the navy divers' ailments and the materials that had been released into the river.

The basis of the fishermen's claims was the epidemiological claim that the percentage of fishermen and workers in the Kishon estuary who had developed cancer was much higher than the percentage of cancer sufferers in the general population. However, the court ruled that "the illnesses [from which the plaintiffs suffer] have very different etiologies and very different characteristics ... in addition, it has emerged in the course of the presentation of the evidence that many other people who worked in the fishing harbor of the Kishon did not contract the illnesses from which the plaintiffs suffer. Furthermore, the data that the plaintiffs have presented from the quantitative standpoint and which pertained to their exposure to the Kishon River's water was far from the actual case, as has been proven."

Shapira pointed out that it is possible that the way of life led by the fishermen (their exposure to the sun and diesel engine fumes, heavy smoking of cigarettes and consumption of alcohol) was the factor that caused a deterioration in their health. He noted that if the fishermen were to present their claims to the pertinent committees in the National Insurance Institute, they might find an attentive ear.

"Court rejects suit of 50 Kishon River fishermen who blame their illnesses on pollution", Haaretz, 06/11/2013, online at: http://mideastenvironment.apps01.yorku.ca/?p=7695

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Prince Hassan calls for equitable sharing of water resources

AMMAN — HRH Prince Hassan has called for the equitable sharing of water resources and greater collaboration to support stability in the West Asia North Africa region.

"If managed effectively as a shared resource, what we have could go so much further — even in our fractious region," the prince said in a keynote speech delivered at the opening ceremony of International Water Week (IWW) in Amsterdam on Monday.

"Despite our strong cultural affinities as individual citizens in the Arab world, and our high degree of environmental interdependence, there is an absolute paucity of collaboration between states," a statement e-mailed to The Jordan Times quoted the prince as saying.

"Our countries have failed to find supra-national solutions to what really should be considered as their collective environmental problems. Each of our main riverine basins is shared among our nations, and as such, the region should be epitomised by interdependence and cooperation."

Speaking as the chairman of the UN Secretary General's Advisory Board on Water and Sanitation, Prince Hassan also highlighted the Millennium Development Goals.

"Despite significant global attention on water following the Millennium Development Goals, 800 million people across the world still go without access to an improved source of water, although this says nothing about water quality, as 2 billion do not have access to a reliable good-quality source."

With the UN World Toilet Day on November 19, the prince used his speech to illustrate the sanitation issue facing billions of people.

"Two-and-a-half billion of our fellow citizens do not have access to a toilet — that's over one-third of the global population. One billion of these, mainly in Sub-Saharan Africa and South Asia, are forced to practise open defecation," he noted.

"A startling fact is that according to UN data, out of a global population of 7 billion, more people — 6 billion — have access to a mobile phone than the 4.5 billion who have access to a toilet."



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IWW and Aquatech, which take place in Amsterdam until Thursday, bring together politicians, decision makers, specialists and water experts from over 40 countries.

" Prince Hassan calls for equitable sharing of water resources", Jordan Times, 06/11/2013, online at: http://mideastenvironment.apps01.yorku.ca/?p=7707

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***** The Jordan River region: A natural refuge produced by warfare

For years the southern Jordan River region has been a closed military zone. The local wildlife has only benefited from this, but will this tranquility continue?

By Zafrir Rinat

Areas in which humans have caused great damage and even spilled blood can, over time, become sanctuaries for nature. Precisely in places that warring peoples have closed off, wild animals can find a relatively quiet and protected shelter. Such has been the fate of the territories along the southern Jordan River that to this day are still designated closed military zones.

The Israel Defense Forces recently agreed to allow controlled visits to the area between the Allenby Bridge and the Jordan River estuary into the Dead Sea to the south. The Israel Nature and Parks Authority plans to allow groups to enter these areas, some of which had been declared nature reserves during the British Mandate, and get acquainted with vistas that for decades had been seen mainly by soldiers. This writer toured the area last week with Moshe Mintz, the regional inspector for the INPA and the Civil Administration of Judea and Samaria.

During the decades preceding the 1967 Six-Day War the southern Jordan River region was humming with activity. This is where the first installations of the Dead Sea Works were built, and members of Kibbutz Beit Ha'arava used the river water. Palestinian farmers cultivated farmland near the Allenby Bridge, and masses of pilgrims visited the many churches and monasteries near the baptismal site in the Jordan River. There was considerable traffic between the West Bank and Jordan over the Abdullah Bridge.

The Israeli communities and industrial enterprises were abandoned during the 1948 War of Independence. After the Six-Day War, the military removed the Palestinian farmers from the area. During the War of Attrition that followed the Six-Day War the entire region became a military zone. The Abdullah Bridge was left destroyed and the churches and monasteries were abandoned.

After the peace agreement with Jordan 19 years ago, Christian pilgrims gradually returned to the historic baptismal site and the army began to withdraw from the outposts it held in the area. The area



remains closed to Palestinian farmers, however, and they will not be able to see it during the organized visits being planned.

The Abdullah Bridge still stands crumbling, as if it were only yesterday that the IDF waged war against the Jordanian army. Near it stands a broken and neglected monument in memory of a soldier who fell in the army's operation against the PLO camp at Karameh in 1968.

Along the river one can see the pumps that had been used by Kibbutz Beit Ha'arava, and to the south of them are the remains of pools that were previously used by the Dead Sea Works. Almost the only activity to take place there recently was the clearing of some of the many minefields.

Protected as it had been for decades from hunters and other disturbances, the area's wildlife had a safe habitat across a fairly wide area. At the beginning of the tour with the INPA inspector an impressive male gazelle emerged from the bushes and then leapt away. The animals have many places to hide and rest in the natural vegetation adjacent to the Jordan River and in the marlstone hills. The area also has a number of springs that serve as an accessible water source.

One species that has exploited the region's geopolitical changes is insect-eating bats, which have found hospitable lodgings in the abandoned army structures. Upon entering one of these buildings with a flashlight, one immediately spots a group of small lesser mouse-tailed bats hanging from the ceiling, in the way of these mammals.

The river's appearance is not at all encouraging. Only a very small amount of water flows here due to both countries' heavy use of it for human needs. The Jordan flows slowly toward the Dead Sea, creating two curves as it enters the sea, while in the background one sees the open view of the arid Arava area connecting Jordan and Israel. The landscape in this place is ever-changing because the Dead Sea is gradually receding.

The future of the southern Jordan River region remains unclear. As pilgrimage tourism grows, and assuming the border remains peaceful, various entities, particularly in Israel, are liable to demand that at least some of the land be utilized for development and tourism projects. This would be diplomatically problematic, since this is occupied territory whose future has not been definitively



decided. From an ecological perspective, it's quite clear that the current situation allows all types of creatures to flourish in relative peace.

"The Jordan River region: A natural refuge produced by warfare", Haaretz, 06/11/2013, online at: http://mideastenvironment.apps01.yorku.ca/?p=7709

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Climate change puts 5m. Israelis at risk of severe flooding events'

The conditions could also result in outbreaks of transmissible diseases from pests such as mosquitoes

Rising temperatures and climbing sea levels due to climate change could be putting more than five million Israelis at severe risk, a special Environmental Protection Ministry report has indicated.

The rise of the Mediterranean Sea's levels as well as the flooding of rivers could gravely impact five million Israelis as water barrels into their communities, the study warned. In addition to the flooding dangers, the conditions could also result in outbreaks of transmissible diseases from pests such as mosquitoes, the report explained. Escalating temperatures combined with population growth will also undoubtedly lead to an increased demand for water from decreasing aquifer supplies, it said.

The report was assembled at the request of the Environmental Protection Ministry by the Knowledge Center for Climate Change, with researchers from the University of Haifa, Tel Aviv University, the Technion and the Shmuel Neaman Institute for National Policy Research.

"Climate changes have for some time already been no longer just a theoretical threat beyond the horizon – it is much closer and much more real," said Environmental Protection Minister Amir Peretz.

"They are also not inevitable or predestined, but processes that are influenced by the actions and deeds of human beings, and therefore, we must address this issue seriously and comprehensively in order to contribute our part toward coping with this."

Within the report are maps that define in detail which areas of cities and the exact streets where flooding will likely occur due to the rising sea and river levels. In Tel Aviv, the flooding could reach up to the Ibn Gvirol Street thoroughfare in the city's center, while similar problematic events could affect Acre, Haifa, Bat Yam and several other coastal municipalities, the report warned.

About 2.5 million people are located in these seaside risk prone areas, while another 2.8 million also may be in danger due to their proximity to rivers, the study explained.



In order to weaken the impact of extreme weather events, the report recommended erecting barriers against flooding as well as increasing the diameters of drainage pipes so that they can handle greater amounts of water at a time. For every \$1 invested in flooding preparation, cities will save about \$8 worth of damage and compensation costs, according to the study.

Despite the rising sea levels that climate change brings, reduced rain events and escalating temperatures will reduce available groundwater for an increasingly thirsty population, the report warned. To cope with some of these challenges, the study suggested using treated wastewater for firefighting and for cleaning streets, as well as collecting rainwater from roofs for gardening purposes and spreading messages about the importance of water conservation.

The government should be encouraging green building, which reduces about 30 percent of electricity consumption and 10% of water consumption, the report added.

Potential heat waves in the future could lead to an increased presence of invasive species, such as mosquitoes, which could bring with them malaria outbreaks and intestinal diseases, the study said. The report recommended that all public institutions be properly air conditioned and that the public always receive timely warnings ahead of extreme heat or cold events.

In light of all the potential hazards described in the new report, Peretz has called for an interministerial committee to convene in the near future and address the subject of climate change in Israel, to be led by Environmental Protection Ministry director-general David Lefler. The committee will include senior officials from 16 relevant government ministries, such as the Health Ministry, the Defense Ministry and the Construction and Housing Ministry.

Together, the representatives will determine ways to prepare for ongoing climate change and rising temperatures, in order to reduce and prevent the anticipated damage, the Environment Ministry said.

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[&]quot;Climate change puts 5m. Israelis at risk of severe flooding events", Jerusalem Post, 06/11/2013, online at: http://mideastenvironment.apps01.yorku.ca/?p=7703



EU-Palestine water cooperation stronger after implementation of research project [ENPI-info]

The production of a business plan, enhanced capacities in research fund raising, technical knowledge, and stronger potential for more integration in the European Research Area: these are some of the outcomes celebrated during the final conference of the PERA (Palestine for European Research Area) project, which has taken place in Tulkram, Palestine. The meeting examined the positive impacts that the EU supported project has had on the capacities of the Palestine Technical University research centre, working towards answering some of Palestine's most important societal challenges related to water and energy scarcity issues in Palestine.

The conference saw the participation of all the important water and energy related stakeholders, who offered a high level of support and involvement in the project. Four final sessions were held, instead of the originally two planned, in order to accommodate and present the extra research produced. PERA has involved the collaboration of four different academic institutions and businesses (Politecnico di Torino, Europe for Business, Palestine Technical University and Fundació CTM Centre Technologic), and has supported the participation of Palestine in FP7. The project was able to weave together structurally important support schemes in a politically and geographically complex context such as Palestine.

These achievements and milestones have also been presented in a video, which illustrates PERA's legacy of laying the foundations of future EU-Palestinian Energy and Water Science and Technology collaboration. Dr. Samer Najjar, the Coordinator of the project, said: "PERA has achieved all its objectives and more, in terms of improving the capabilities of the Palestine Technical University to carry out sustainable research in Water & Renewable Energy sectors."

PERA – Palestine for European Research Area – is funded under FP7, the Framework Programmes for Research and Technological Development, also called Framework Programmes, created by the European Union in order to support and encourage research in the European Research Area (ERA).

"EU-Palestine water cooperation stronger after implementation of research project [ENPI-info]", 04/11/2013, online at: http://mideastenvironment.apps01.yorku.ca/?p=7687

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Straeli water tech comes to rescue of EU farmers

The Netafim drip company is leading a European project to ensure that crops are irrigated in the most productive way possible

The green fields of Europe are struggling to stay watered. A number of factors, from climate change to population growth to government policies, have turned even areas where water was previously plentiful into thirsty regions, where irrigation and other methods to manage water have become necessary. For much of Europe the concept of water management is relatively new, which is why an Israeli company known for its expertise in water management technology is stepping in.

A good example of the phenomenon is northern Italy's Po Valley, the country's breadbasket, where farmers have traditionally grown everything from asparagus to zucchini — including rice, one of the few places in Europe suitable for that crop. Dairy, beef, pork, and other farms abound, as they have for hundreds of years.

The heart of the valley is the Po River, the longest in Italy. With hundreds of tributaries pouring into it the river floods every few years, at times displacing hundreds of thousands of residents but guaranteeing fertile farmland.

But Po Valley farming isn't what it used to be. Natural vegetation on nearly a quarter of the land next to the river's shore has been replaced by trees that are cut down every few years by paper manufacturers; along the length of the 652-kilometer river lie 143 dammed reservoirs specifically for hydroelectric production; construction companies have raided the river for sand and gravel, leaving large holes in the riverbed and negatively affecting drainage; and more recently, farmers have abandoned the diverse crops they used to raise, switching to soybeans and corn in order to take advantages of EU subsidies for crops to be used in bioenergy production.

According to experts, the disruption of the traditional ecosystem has had a devastating effect on water reservoirs as the new crops require much more water than the traditional mix did. Add to that the fact that the city of Milan has for years dumped untreated sewage into tributaries that feed into the Po, and you have the makings of a water crisis in an area that has sustained millions of people for centuries without help.



It's a story that is repeating itself throughout Europe: urbanization, population growth, pollution, government policy, and recurring drought (there's currently a major one going on in Austria and Hungary) have prompted the EU to try new ideas and technologies to manage water more efficiently.

Enter Israeli drip-irrigation pioneer Netafim, which is leading an international consortium to develop new precision technologies that will improve irrigation management, thus increasing water availability for water-intensive crops.

Called FIGARO (Flexible and Precise Irrigation Platform to Improve Farm Scale Water Productivity), the $\in 6$ million project will "build a system to enable precise irrigation based on humidity, climate conditions, plant needs, and other factors, all based on a smart computerized system," said Adriano Battilani, scientific manager of the FIGARO project and an author of the master plan, which is being conducted in conjunction with the Food and Agriculture Organization of the United Nations.

"We are building a platform with multiple sources of information that will use existing knowledge to implement new models of management appropriate to the current situation," Battilani said at the recent WaTec Israel 2013 Exhibition and Conference.

Founded in 1965, Netafim pioneered the drip irrigation revolution, but has since widely expanded its offerings to include sprinklers, pipes, irrigation equipment, agricultural machinery, and more, many of them equipped with sensors that can read temperature, humidity, nutrient levels in the soil, whether a plant needs water, and other important data. The systems are controlled by software run from a server communicating with sensors in the field wirelessly, with the software providing instructions to each part of the system as to how much and when water should be dispensed.

It's those capabilities EU farmers need in order to make the most of their water, said Battilani. "The integrated and automated precision, irrigation management and decision-supporting tools, models and devices that are being developed will allow for a substantial reduction in fresh water use in irrigated agriculture."



Coupled with recycling technologies and water conservation practices the EU is implementing, the Israeli-developed technology being provided by Netafim will have a big impact on European farming in the years to come, he added.

The project is already running at nine sites in Europe and Israel as a pilot program. Assuming the pilots achieve their goals, FIGARO will be expanded to the rest of Europe, said Battilani.

"The software application of precision irrigation has a large potential to lead to savings of water energy and other inputs such as fertilizers and pesticides," said Netafim's lead on the project and the director of the company's Crop Management Technology department, Lior Doron. "By applying the platform that FIGARO plans to develop, the savings will be beneficial for farmers and other stakeholders. Investment decisions by farmers will benefit from a Cost Benefit Analysis. Regional managers will consider environmental impacts, both at the location of implementation and at the specific sites where saved water might become available.

"In order to develop a transferable system, it must be financially attractive to stakeholders in the short-medium term," added Doron. "It must be practical and easy to implement by the direct end users, including farmers and agronomy consultants."

That, said Battilani, is exactly what FIGARO is all about. "Water management in the EU is a complex problem, and a complex problem requires complex solutions," he said. "This is a real challenge for the future, and with Netafim's help I believe we are going to be able to meet this challenge."

"Israeli water tech comes to rescue of EU farmers", 06/11/2013, online at: <u>http://www.timesofisrael.com/israeli-water-tech-comes-to-rescue-of-eu-farmers/</u>

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✤ Israel faces water surplus

The Water Authority is considering scaling back production at desalination plants.

Winter is late this year, and the <u>Water Authority</u> is monitoring the water level in the Kinneret with concern. If you think you know the rest of this sentence, you're in for a surprise: the Water Authority is not worried that the Kinneret's water level is too low, but that it is too high. Its website states that, as of Tuesday morning, the Kinneret's water level was 211.34 meters below sea level, just 3.5 meters below the upper red line of minus 208.80 meters, above which the lake will overflow its shores.

This may sound like a lot, but that depends. In an above-average winter rainy season, the Kinneret rises by three meters, and in the very wet 1992 season, it rose by no less than five meters. This year's precipitation is forecast to be average, but <u>Mekorot National Water Company</u> has decided not to take chances, and two weeks ago, it carried out a secret test to open the Degania Dam. This obsolete dam allows water to flow from the Kinneret to the water-deficient lower Jordan River, which flows to the Dead Sea. The last time that the Degania Dam was opened was in the winter of 1992.

The glass is half full

Both the Water Authority and the <u>Ministry of Finance</u> take the water surplus very seriously, and a dramatic decision has been reached in internal discussions: according to preliminary assessments, Israel's desalination plants will be asked to scale back production by 100 million cubic meters. This is the annual capacity of the new desalination plant that Mekorot is building at Ashdod at a cost of NIS 1.5 billion.

The Water Authority states with pride that the government made sure to include in the contracts with the desalination companies a clause allowing it to pay a reduced rate for water that it does not buy. But this is the half-full part of the glass. Although the government is exempt from paying the desalination plants' operating costs, such as electricity and labor, for water that it does not buy, it is committed to pay the capital cost, which is mainly repayment of the investment in these very expensive facilities. The price of desalinated water is NIS 2.60 per cubic meter (1,000 liters), 40% of which is for variable operating costs, and 60% of which is for fixed costs.

Therefore, if we look at the half-full part of the glass, we can say that the heavy rains in the past few years enables the government to save NIS 100 million by not buying expensive desalinated water



from the desalination plants. But if we look at the half-empty part of the glass (the 60% empty part to be precise), we can say that the government will have to pay the desalination companies NIS 160 million not to work. Sounds hallucinatory - no? Wouldn't it be better to operate the plants and increase the farmers' water quota or lower consumer water rates?

Mutual loss

The odd thing about this story is that, in the past few years, we have heard the Ministry of Finance's constant refrain about the great desalination scandal. How is it, that after one good rainy season, the ministry halted plans to build seawater desalination plants, threatening the country with dehydration? Even with Israelis' short public memories, we ought to remember the draconian ban on watering lawns and the "Israel is drying up" campaign hosted by Renana Raz.

The fact that water rates have been hiked 30-40% has been interpreted as part of the important government effort to reduce consumption. How is it that, within two years, Israel has changed from an arid desert to the Norway of the Middle East? Who is to blame? What can we do about the water surplus?

The answer to the first question is quite simple, at least according to the Water Authority. The weather is to blame, because, as we know, it is fickle. Israel was brought to brink of drying up after eight straight years of drought: "The longest drought since Jacob and his brothers went down to Egypt," as Water Authority spokesman Uri Shor put it.

But the 2012 and 2013 winters both had above average rainfall, and hundreds of millions of cubic meters of water were unexpectedly added to Israel's natural reservoirs. At the same time, Israel's desalination production capacity will be doubled from 300 million cubic meters a year in 2012 to 600 million by June 2014, when Mekorot's Ashdod desalination plant will come online. In addition, the Soreq desalination plant, the world's largest, became operational in October. This was not enough for the Ministry of Finance, and, two years ago, it initiated the doubling of the Palmachim desalination plant's capacity.

Was the huge NIS 3 billion investment in desalination plants in vain? "Not really," insists the Water Authority. "Even if the plants don't work at full capacity in the coming year, we will soon definitely



need their output. Our models predict an even worse drought than the one before 2011 at the end of the decade. In addition, the Kinneret and aquifers still lack one billion cubic meters of water. The Israeli economy has a structural water shortage, and one rainy year does create a new reality."

This is where the really hard question arises. Both sides lose from the non-operation of the desalination plants: the plants' franchisees will not see their hoped-for profits, and the public is paying for desalination plants that are not producing water. However, the Water Authority is convinced that this is the most economical decision for the economy, because any other solution will cost more. For example, the idea of using desalinated water to refill the dwindling aquifers is more expensive than waiting for the sky gods to fill them for free. For this reason, Mekorot will continue pumping water from the Kinneret to prevent it overflowing its banks. "It is cheaper to pump water from natural sources than to buy water from the desalination plant at the full rate," says a Water Authority source.

Some people in Israel's water economy think otherwise. "The Water Authority is conservative and does not look at the full picture," says a source involved in desalination. "Let's assume that the government buys the surplus water and sells it to farmers at a reduced rate. The result will be less than the NIS 160 million that will go down the drain, and Israel's agricultural produce and exports will increase in exchange."

Another option is to subsidize consumer water rates for less than NIS 160 million. The savings won't be great, but at least the public will feel that, after the ban on watering lawns, it gets something when the rain falls.

The Water Authority said in response, "There is no water surplus. There is water production capacity for guaranteeing a reliable water supply, even during droughts. The Israeli government prepared for this in part by building seawater desalination plants, which supply water on the basis of need and the condition of the water economy. During droughts, when natural water supplies fall, we'll need maximum production by the desalination plants, because the water demand does not change. In years with heavy rain, we have to deduce desalinated water production, because the variable cost is higher than the cost of natural water production (depending on the condition of the water economy). The reduction in production is on the basis of the contracts with the companies.



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"The outcry by the companies which built the desalination plants is understandable, even though they are not losing money from the measure, but will make smaller profits. The proposal to sell water to farmers is irrelevant. In the past two years, water quotas for farmers have been greatly increased, and for the first time in history, the farmers have a three-year quota. The allocation of fresh water for agriculture in the next three years is 1.8 billion cubic meters. The annual allocation is 570-640 million cubic meters, compared with 530 million cubic meters allocated this year. We hope that the farmers will use these quantities, because in past years, even when the allocation was much smaller, the full allocation was not used. It's important to note that the water allocation for different farmers is based on regulations set by the agriculture minister, pursuant to the law."

"Israel faces water surplus", 05/11/2013, online at: <u>http://www.globes.co.il/serveen/globes/docview.asp?did=1000891490&fid=1725</u>

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✤ Water-stressed globe to face increased thirst: study

By the end of the century, an increased demand for fresh water will hit certain regions harder than others, according to new research at Pacific Northwest National Laboratory.

Projections analysed by the team show that the Middle East and India, already dealing with water scarcity, will face even more water stress.

Including sectoral water requirements for the first time in a prominent, complex model specifically designed to link economic, energy, land-use and climate systems, the researchers showed future fresh water requirements from the energy, agricultural and municipal sectors of the economy. The study indicates that water conservation technologies and practices likely will have an increasingly important and unavoidable role in water-use planning.

Why It Matters:

Water, food, air - three essentials all humans need to survive. Fresh water, and plenty of it, for whatever purposes humans require always has been an imperative.

Understanding how this vital resource may be affected by future climate change, taking into account complex technology, energy, climate and human-use issues, has never been more important.

In this study, researchers showed how historical assessments of water requirements that assumed water scarcity would not restrict climate change mitigation or adaptation policies likely are off base. Instead, their study shows that water availability will increasingly be stressed as the climate changes, especially in already-dry regions. If society is going to address the impacts of climate change, gathering solid projections of possible futures is essential.

Scientists working at the Joint Global Change Research Institute (JGCRI), a partnership between Pacific Northwest National Laboratory and the University of Maryland, used the Global Change Assessment Model (GCAM) to run global projections of water demand and use through the end of the century.



GCAM, developed at PNNL with support from the US Department of Energy (DOE), is an integrated assessment model (IAM) that performs complex and detailed projections of future climate states.

The team assessed future water demands in the agricultural, energy, industrial and municipal sectors within GCAM.

They assigned base-year water requirements to specific activities to maximise consistency between bottom-up estimates of water demand intensities of specific technologies and practices and top-down regional and sectoral estimates of water use. They represented these scenarios through 14 geopolitical regions with the agricultural sector further divided into as many as 18 agro-ecological zones within each region.

Three sets of factors are important for understanding future socioeconomic challenges to mitigation and adaptation:

-Population and demographic conditions

-Socioeconomic development trajectory, measured by the United Nations Millennium Development Goals (MDGs)

-Technology used in producing and consuming energy, agriculture and other goods and services.

Considering these factors, the research established six future scenarios. Within these six storylines, the team identified two broad descriptors:

-either progress develops ahead of or copes with rising populations or

-the objectives described in the UN MDGs are not achieved and the proportion and number of the extremely poor increases.

For each group, the researchers explored the implications of these sets of futures and their associated trends in domestic governance, international relations, population patterns and environmental conditions.

Their goal was to examine the demands on water and other resources, as well as the human, financial and environmental capacity to meet them.



The Integrated Assessment Research Program (IARP) in the US Department of Energy's Office of Science supported this research.

"Water-stressed globe to face increased thirst: study", 06/11/2013, online at: <u>http://www.domain-b.com/environment/20131106 water stressed.html</u>

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GCC's power and water needs rising 7% annually

Approximately 80,000 MW of additional power and 290 million gallons of water will be required by GCC countries per day by end-2015 at an average of seven per cent annual growth as the region struggles to meet the high demand caused by increasing population and new infrastructure projects, according to conservative estimates by regional utilities companies.

"As the region explores ways of supplying the high demand for both power and water, private utilities companies in the region are faced with a major challenge — obtaining finance and funds for new projects," said Richard Menezes, Managing Director of Utico Middle East. "As with the rest of the world, regional utility companies struggle with finding the right contract with the right terms and right financiers, while debating the right tariffs and policies."

These issues will be raised by government authorities and private sector companies in the Middle East along with their counterparts from across the world at the 2nd Annual Global IWPP (independent water and power projects) Summit organised by Fleming Gulf and taking place in Ras Al Khaimah from November 24 to 26.

The summit is being held under the patronage of His Highness Shaikh Saud bin Saqr Al Qasimi, Member of Supreme Council and Ruler of Ras Al Khaimah, and will be attended by senior executives from the region's utility and energy sectors.

"GCC's power and water needs rising 7% annually", 03/11/2013, online at: http://www.khaleejtimes.com/biz/inside.asp?xfile=/data/uaebusiness/2013/November/uaebusiness November30.xml&sec tion=uaebusiness

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* River Nile .. The Gift of God

The River Nile is about 6,670 km (4,160 miles) in length and is the longest river in Africa and in the world. Although it is generally associated with Sudan and Egypt, only 22% of the Nile's course runs through Egypt.

River Sources Lake Victoria:

It is biggest African lake, is generally thought of as the source of the River Nile. On the northern edge of the lake, water pours over a waterfall, which known as Ripon Falls into a narrow opening which some people believe is the beginning of the River Nile .The true source of the River Nile Ripon Falls may be the starting-point of the river, but the many streams that flow into Lake Victoria could claim to be the true source .Much of Lake Victoria is surrounded by mountains with streams tumbling down into the lake. The largest tributary of Lake Victoria is the Kagera River. The Kagera and its tributary the Ruvubu, with its headwaters in Burundi, is now considered to be the true source of the Nile. It is from here that the Nile is measured as the world's longest river

Lake Tana:

It is Ethiopia's largest lake and the source of the Blue Nile, which spills majestically over the Tis Issat Falls into the 600 kilometer-long Blue Nile gorge. It provides most of the water and sediment that reaches Egypt.

Political and Social Aspects

Professor, Barakat Mousa Al-Hawati said that the Nile is a source of ancient civilizations, including Aksum civilization around Lake Tana, ancient Meroe in Bijrawia area, Kingdom of Napata and civilization of the Pharaohs in the north of the valley. He pointed out that there were cultural and friendly relations between ancient civilizations, while relations of rivalry between these civilizations have emerged in the modern era. He said that the Renaissance Dam is the biggest challenges facing



the basin countries, as Egypt has an opinion on its establishment.

Al-Hawati said that the Sudanese elites not interested in the subject of the Nile Basin, as the Egyptians do, as they established research centers to the issues of the Nile water, while the Sudanese knowledge confines in the floods that damaging areas around the Nile, pointing out that there is now Sudanese openness on Egypt and Ethiopia in various aspects.

In social terms, Al-Hawati said that at the top of the headwaters of the Nile shows the Christian presence, while Muslims in the valleys. He said that there is a civilization in Amhara area similarity of Saba civilization, which originated in Yemen and they had their own culture, customs and ethics, while we find joint border tribes in the border of Sudan, such as Anwak, Funj and Watawit.

Al-Hawati said that here is no full social homogeneity among the population of the Nile, as there are many languages ??and dialects belonging to each tribe and region.

There is no perfect match in the customs and traditions among the inhabitants of the Nile, but there is a similarity in uniform and lifestyle.

Ancient civilizations have had social relations and that the immigrant population was professing the culture of the local population, but there was competitive relationships and clear conflict on the wealth of the Nile.

Nile, the Source of Spiritual Aesthetics

Professor Rashid Diab said that the Nile man is different from the others and saturated of spiritual aesthetics of the Nile, indicating that life near the Nile means stability, where the oldest civilizations was founded along its banks, indicating that the Nile had impact on the lives of the people, where they offered sacrifices to it.

Diab said that personal living near the Nile associated with its volatile state of ebb and flood, as it is linked to their interests of agriculture. The Nile gives a sense of immortality and continuity of life and donation without charge, so the Sudanese character associated with these beautiful qualities since ancient times.

He said that the Nile has a significant impact on art in Sudan, which embodies in the color reflection resulting from the reflection of sunlight, high temperatures and the moon on the water and its change in the seasons and throughout the day with the movement of the sun.

Diab said the Sudanese brush does not reflect the Nile in its external form of water, flow and others,



but also in the content of immortality, survival and continuity of flow and unlimited donation. He said that the Sudanese artists embodied the Nile in all times of the day in paintings attracted global scenes.

Diab said that the Nile is a source of energy and inspiration for the Sudanese artists, adding that it is different from all other rivers, in addition to being a source of high fertility, continuity and eternal youth.

"River Nile .. The Gift of God", 10/11/2013, online at: http://news.sudanvisiondaily.com/details.html?rsnpid=228727

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***** Ethiopia and Sovereignty over the Blue Nile

PART ONE: DEVELOPMENT AND SOVEREINTY

I. Introduction

In General: The events of the last four weeks may as well have determined the future course of Ethiopia's sovereignty and territorial integrity. On October 7, 2013 Prime Minister Hailemariam Desalegn made some remarks in a Press Conference that will resonate for years and make or break his political future, as well as the future of Ethiopian partisan politics. What I heard on video of the News Conference of October 7, 2013, is the most incredulous statement by Prime Minister Hailemariam Desalegn so far. He announced that he will welcome the participation of Egypt and Sudan in the construction of the Renaissance Dam and that his government and he consider the Dam to be "jointly owned" by Ethiopia, Sudan, and Egypt.

To make this type of statement at this early stage of the controversy by a Head of Government is unconscionable and the worst form of negotiation strategy I have ever witnessed or read about in our long history. Such fast retreat of leadership in front of a national controversy is unheard of in Ethiopia's long political life. However, to be fair to all concerned, let us examine the situation surrounding this sudden reversal of historic position, carefully and dispassionately. Mind you that there is no serious threat by anybody against Ethiopia except some habitual bullying by Egypt, and a few months ago by an errant Prince from Saudi Arabia (who was promptly removed from office) that the Prime Minister of the Ethiopian Government should be trembling with fear and trepidation and recapitulate so easily. Even if there is real military threat against the sovereignty and integrity of Ethiopia, is the statement by the Prime Minister within acceptable discretionary power of his office? I think not. The Prime Minister has far exceeded his duty and power circumscribed by the provisions of the 1995 Ethiopia's Constitution: Article 55 (2) (a); 55 (17); Article 74 (6); Article 86, when he spoke of creating some kind of joint ownership of an Ethiopian asset that borders of surrendering sovereignty and territorial integrity of the Ethiopian State..

As a simple strategy of negotiation one does not show the hand that one holds at the initial stage of confrontation with a historically ever belligerent foreign national government. Egypt and the Arabs in general have been the relentless enemies of Ethiopia for centuries to this day. They have sought the destruction of Ethiopia despite admonishment of the Prophet Mohammad since the eighth century.



They never heeded the words of their own Prophet. At this very moment they are busy mobilizing to halt the development effort of Ethiopia by throwing obstructionist threats. A type of prescription I have for my fellow Ethiopians is that when we seek peace and development we need get ready for war.

The construction of the Great Renaissance Dam on the Blue Nile within Ethiopian territory is indisputably an act of Ethiopia's Sovereign power. Whether such construction was premature, too ambitious, problematic due to lack of technical expertise et cetera are issues that should not be confused with competence or sovereignty. Ethiopian successive Governments for almost a hundred years have openly stated their desire to take into account the national interests of both Egypt and Sudan in the effort to create an equitable use of the waters of the Nile and its Basin for all riparian states. Egypt has refused to recognize the fundamental sovereign rights of riparian states to use the waters of the Nile some of such states being originating/source countries. Currently, the Ethiopian Government seems to be committed in its effort to bring about fairness and equitable use of the Nile waters among riparian states to the extent of offering the Great Renaissance Dam in joint ownership to Egypt and Sudan. As I stated earlier, I am not convinced such generosity on the part of Ethiopia will help solve the greed of Egypt.

Issues to consider: Even though such unbelievably generous offer by the Government of Ethiopia may be applauded by some, I am much concerned not only with the future of the Dam itself but also with the continued existence of Ethiopia. Some of the most pressing issues are as follows: What is the meaning of "joint ownership"? What are the risks for Ethiopia sharing ownership of its natural resource with foreign sovereign countries and their governments? Are there legal regimes and/or political modalities to insure the Sovereign right of Ethiopia on the Dam and the Water resource of the Blue Nile and its basin at all times? What effect would such "joint ownership" have on other riparian States of the Nile River? What is the need for secrecy (lack of transparency) of the Ethiopian Government?

II. A. The Development Imperative and Sovereignty

The United Nations International Covenant on Civil and Political Rights of 1966, in Article 47 states that "nothing in the present Convention shall be interpreted as impairing the inherent right of all peoples may, for their own ends, freely dispose of their natural wealth and resources." Ethiopia ratified the Covenant on 11 June 1993, and Egypt signed twenty five years earlier on August 4, 1967



and ratified the document on 14 January 1982; Sudan ratified the Covenant 18 March 1986. As of May 2013, the Covenant had 74 signatories and 167 parties.

This section of the Covenant is what is claimed to be the basis of the concept of "permanent Sovereignty" on natural resources by members States of the United Nations. To me that concept has become part of the customary international norm and principle as customary international law. Thus, when we are discussing sovereignty over the resources of a country, we are not simply dealing with historical reality but also recognizing concepts in international law and relationships of States. Of course, the concept "permanent Sovereignty" over resources has undergone modifications and its own exceptional development, such as the idea of equitable use of shared resources, the new Sovereign Wealth Funds and State-Owned Enterprises et cetera.

World population prediction for 2050, i.e., in a mere thirty five years from the present time, draws a grim and alarming reality for Ethiopia. The estimate listed here under seems to be on the conservative side, for a fact we know the 2015 prediction for Ethiopia is too low since Ethiopia's population for 2013 exceeds by almost ten million people the United Nations estimate for 2015. I believe the estimate for 2050 would be about 200 million for Ethiopia. We have now in our hands an ongoing population explosion—a disaster in the making unless we implement some creative and daring developmental programs. The harnessing of the power of the Blue Nile is one out of very many concerted steps to be taken by all states in the region. The increase in population means dramatic increase in the demands for services, food supplies, housing, schools, universities, infrastructure, et cetera. Putting to good use our natural resources is a matter of duty/right of acute necessity and not a luxury. One must take into account the enormity of population growth in all the nations of the world in order to understand our precarious existence in the next fifty years.

1950 2000 2015 2025 2050 Ethiopia 18,434 62,908 89,765 113,418 186,452 Egypt 21,834 67,884 84,425 94,777 113,840 Sudan 9,190 31,095 42,433 49,556 63,530 [Source: United Nations Population Division]

[Source: United Nations Population Division]

How is Ethiopia going to feed that many people (almost two hundred million people) with its existing economic system and limited programs of farming and industrial involvements? Ethiopia has no choice in the matter but to develop its hydropower as a cheap source of energy in order to develop its



agriculture, industry, education, democratic governance, and good relationship with its neighbors and the world at-large. A poor and devastated Ethiopia is a real danger and threat to the region. By contrast, a prosperous and engaged Ethiopia is the dynamo for the region's much needed development and stability.

There seems to be a degree of confusion between source of power/right and the scope of that power/right in regard to Ethiopia's position on the waters of the Nile River and the Blue Nile and its Basin. There is also a tendency to lump all riparian states of the Nile River in the same cast of characteristics. Very many distinguished Ethiopians, such as Zewde Gebre-selassie, Daniel Kendie, Gebretsadik Degefu, Tesfay Tafesse, et cetera have devoted time and energy tackling several questions dealing with Ethiopia's natural resources and on the development of such resources and the modality of the proprietary rights thereof.

A recent addition to such distinguished Ethiopians tackling the historic problem of sharing the waters of the Nile/Blue Nile and the Basin thereof is Fasil Amdetsion. Fasil Amdetsion is a rising star in international (law) jurisprudence and a highly capable lawyer. His long academic journal article on the Nile/Blue Nile controversy is an excellent read. [Fasil Amdetsion, Scrutinizing "The Scorpion Problematique"..., 44 Tex Int'L J (2008)] One reservation I have on that article is that Fasil seems to overlap Ethiopia's source of power on the waters of the Blue Nile and its Basin with the scope of that power. For example, he asserts that Ethiopia's position of absolute "Sovereignty" on the Blue Nile River is untenable under international law. My criticism of such position is a rhetorical one by arguing that in the same way Egypt has based the source of its claim on treaties and cite provisions from those same treaties to assert the scope of its proprietary/use rights on the waters of the Nile, Ethiopia uses "Sovereignty" as a source for its proprietary rights but not as an absolute, for Ethiopia has always promoted the idea of "equitable" use of the waters of the Nile/Blue Nile among all riparian States. There are situations in the past, under extreme provocation and in the face of belligerency of Egypt and Sudan, whereby Ethiopia as a matter of rhetorical argument might have stated that it has the ultimate sovereign power over its natural resources and territorial integrity and threatened to dam the Blue Nile. Such statements must not be taken as Ethiopia's foreign policy position, but for what they are—just rhetorical statements.

The provisions of the Nile Basin Initiative (NBI) that was established in 1999 reflect far more accurately Ethiopia's position as an active member of NBI. The NBI clearly shows that the derive is



to replace the 1929 (later amended in 1959) colonial treaty that divided the entire Nile water between Egypt (75%) and Sudan (25%), completely ignoring the riparian rights of ten States including Ethiopia from whose highlands 86 % of the Nile water flows from. Not all riparian States of the Nile River are "Scorpions," as Fasil would label them in his academic article, but most are victims of the greed of Egypt, the only "scorpion" in that group of riparian states of the Nile. The irony of it all is that Egypt does not contribute even a single drop of water to the Nile River, but is monopolizing its use to the tune of over 80% in absolute terms.

II. B. Claims by Egypt and the Polarizing United States Military Assistance

The Anglo-Ethiopian Treaty of 1902 is an important Treaty that shows clearly how a colonial power forced its hand on a sovereign independent nation's natural resource. The 1902 Treaty is seldom mentioned by Ethiopian scholars and by Ethiopians in general. Even though there are serious conflicting provisions between the Amharic and the English versions of the Treaty, the Treaty overall shows the coercive colonial power of Great Britain in getting unconscionable concessions from a relatively weak Emperor of Ethiopia. The Treaty arguably either forbid the construction of any work without agreement with Britain that "arrest the flow" (English version) or "completely block" (Amharic version) the waters of the Blue Nile, Sobat, or Lake Tana. There is also problem of interpretation as to the identity of a "third party" or Ethiopia acting for her own self-interest.

Nevertheless, Egypt has been consistent in its claims as a "historic user" not as a "sovereign" on the waters of the Nile. Egypt has never claimed any form of direct ownership or sovereign right on the waters of the Blue Nile or on any of the head waters of the tributaries of the Nile River. What Egypt has claimed in the past and what it is claiming now was the "historic use" of the waters of the Nile based on treaties as well as history. Ethiopia and other riparian countries claim that the standard must be the "equitable use" of water and not "historic use" of water that lopsidedly favors Egypt completely over other riparian countries including those countries that are headwater (source) countries.

If Egypt has its way, it wants to maintain its share of the yearly quota allocation of over 55 billion cubic meter water under the 1959 agreement it entered with Sudan. This has nothing to do with Ethiopia for Ethiopia is not signatory to such agreement. In fact, Ethiopia has repeatedly officially through diplomatic channels let it be known that it is not bound by agreement of third parties and



would maintain is sovereign right on its natural resources including rivers, lakes, and territorial waters. Moreover, one must examine to what use is the water of the Nile is being used in Egypt.

The Ethiopian Government officials have failed to organize and disseminate factual/statistical data on Egyptian use of the water of the Nile detailing the types of abusive use of precious water. We still do not have a detailed water use profile and statistical data on Egypt's use of the water of the Nile. For example, we have no idea how much water is being used in Egypt on frivolous schemes, such as watering golf courses in resort areas, feeding swimming pools, et cetera while in Ethiopia millions of Ethiopians are experiencing famine, poverty, lacking clean drinking water et cetera.

After the press Conference of October 7, 2013 Egypt has issued its new expectations and how far it is interested in safeguarding its national security and economic interest, through an official, who chose to remain anonymous, on October 16,

"The government has prepared a new paper to negotiate with Ethiopia regarding the Renaissance Dam. Technical and legal teams have been tasked with studying the Egyptian [negotiating] items, which are expected to be presented to the Ethiopian side at the next meeting. ... The Egyptian offer includes full participation in the construction, management and operation of the dam, by dispatching Egyptian engineers who specialize in the field of dam construction; the signing of an agreement with the Ethiopian side on sending [to Ethiopia] a permanent Egyptian water mission [that will be stationed] at the dam; and [Egypt's] participation in the funding and working as an intermediary to obtain aid and international loans and grants to finance dam construction." [Ayah Aman, Al-Monitor, October 23, 2013]

One serious problem facing Ethiopia, which is in the background of most conflicts that threaten the survival of Ethiopia, is the military assistance of the United States to Egypt to the tune of a couple of billion dollars every year for the last two decades. Such polarizing assistance to Egypt seems to add to the arrogance and inflexibility of the Egyptian Government. The United States Government either must stop such outrage or provide Ethiopia also with as much military assistance as it does to Egypt. Egypt did not help the United States in its global effort to squash Al-Qaida terrorist members. Some of the leaders of such anti American groups are Egyptian citizens. By contrast, the Ethiopian Government is fully engaged in the fight against terrorism with the United States as a partner for



peace and security. Why is the United States always undermining Ethiopia's interest at crucial moments in our history for the last one hundred years of relationship with the United States?

PART TWO : JOINT OWNERSHIP OF NATURAL RESOURCES

III. Joint Ownership

The current concept of "joint ownership" has its root in Roman Law as "dominium" and "condominium." However, the literature shows that form of ownership/possession was not popular nor an accepted form of ownership and even of possession between states. "Sovereignty" is a very jealous mistress and would not allow any other Sovereign power to share in its domain. From hundreds of dams constructions around the world only a handful are jointly owned by two or three Sates. Even those very limited jointly owned dams are not free from great conflicts and most often on the verge of complete breakdown and possible war. For Ethiopia, as well as, for Egypt and Sudan, this idea of "joint ownership" of an Ethiopian natural resource is extremely dangerous in creating another flash point between the three countries and their supporters.

"Co-ownership refers to legal relationships that entitle two or more entities to equal rights to the use and enjoyment of property. Although it most often arises in the context of real property, coownership may apply to any type of property. Co-ownership also takes numerous legal forms.... In each case, the central economic and legal problem is how conflicting preferences and actions of the co-owners can be coordinated. In the absence of such coordination, owners may overindulge in activities that impose costs on their co-owners and under invest in projects or activities whose benefits are shared with co-owners. The legal mechanisms used to cope with these externality problems range from doctrines that impose liability on co-owners for engaging in inefficient activities (such as the law of waste), to legally mandated common decision-making (as in compulsory unitization statutes), to forced termination of the co-ownership relationship (partition). In addition, successful coordination and decision-making in co-ownership situations often depend on social sanctions and norms outside the domain of law." [Marshall E. Tracht, ENCYCLOPEDIA OF LAW: co-ownership and condominium.]

III. A. Joint Ownership of Ethiopian Asset

What is the meaning of "joint ownership"? What is the legal and political significance of "joint ownership" of Ethiopian national asset and natural resource by Egypt and Sudan? In international law the idea of Joint ownership is not something new, in fact, it goes by an old name from Roman legal



concept of "condominium," which in our days is often used to identify individual apartments run by jointly owned system. However, the legal literature that is of record that includes the United Nations' International Court of Justice as well as the decisions of arbitration tribunals is very limited almost to a point of non-extant. The ICJ had decided only on one case in controversy in the last sixty years. In other words, joint ownership by Sovereign entities is not a popular process at all.

The pronouncement of the Prime Minister on October 7, 2013 Press Conference is like a lightning strike in broad daylight—something that has no legal or historic precedence. The Ethiopian Government can minimize the premature statement by the Prime Minister in the following two steps:

1) by censoring or rebuking the Prime Minister that he had exceeded his authority in making such sweeping statement that affects the Sovereignty and territorial integrity of the nation and instructing him to withdraw his statement of October 7, 2013 [1995 Constitution: Article 55 (2) (a); 55 (17); Article 74 (6); Article 86];

2) by creating a structure that will prevent either Egypt or Sudan any direct ownership in rem the Dam and/or the Blue Nile and its Basin. One way of doing that is to create a public utility corporation that will be owned jointly by Ethiopia, Egypt, and Sudan. This joint ownership of the public corporation may be extended to all Riparian States of the Nile.

The "Public Corporation" thus instituted leases the Dam from the Ethiopian Government that is the sole and only owner and the only Sovereign power over the Dam and the Blue Nile and its Basin. The public corporation will not have any ownership right of the Dam; It has a lease contract renewable every twenty five years for a maximum lease period not exceeding one hundred years. The public corporation will run the Dam as a business enterprise; it will control the flow of water, the distribution and sale of electric power, manage all administrative work, undertake all ongoing upkeep and maintenance of the Dam, and provide annual report to the "Share Holders" of the corporation. The Ethiopian Government will receive royalty for leasing the Dam to the corporation and for the use of the Blue Nile water resource. Since the Ethiopian Government is the majority share holder in that corporation, it will also be entitled to the percentage share of the profit of the corporation. Here is where Egypt and Sudan exert their control/influence in the day to day administration of the corporation thus created.



III. B. Slippery Slop: military engagement with Egypt and Sudan

For the time being Egypt may not sound as aggressive as it was at the start of the controversy in 2011 and even more so a few months ago in 2013. However, Egypt will increase its demand as time goes by with the increased pressure to complete the Dam in reasonable time. In fact, Egypt will demand that a contingent of its military force be stationed near the Dam in Ethiopia or across the border in Sudan in order to ensure the safety and security of the Renaissance Dam that it now owns jointly with Ethiopia and Sudan. Such deployment of security forces will pause a permanent threat to the security and sovereignty of Ethiopia. If there is any form of civil strive, the Egyptian forces would have clear excuses to occupy the Dam area within Ethiopia in order to protect Egypt's joint ownership of the Renaissance Dam.

We must also ask about the ramification of such joint ownership on the other Riparian States such as Kenya, Tanzania, Uganda, and South Sudan. The recent activity and pronouncement in press conferences by the Leaders of the Ethiopian Government have already casted Ethiopia as an unreliable partner in any form of controversial relationship with Egypt and the Arab world in general. I do not believe the Ethiopian Government has consulted with the other Riparian States (NBI members) on the idea of "joint ownership" of the Renaissance Dam. This form of sporadic, crises-based reactionary actions, secrecy, et cetera by the Leaders of the current Ethiopian Government will undermine the legitimacy and authority of the Government itself.

III. C. Joint Ownership of Aswan Dam and the Suez Canal by Ethiopia

The Ethiopian position as stated by the Prime Minister on October 7, 2013 seems to upgrade the claims of Egypt of unlimited use the water of the Nile to a level of ownership of the Blue Nile and all the waters of the basin itself. This is a windfall for Egypt and the Sudan. Now Egypt and Sudan are going to have a proprietary right that will eventually be casted in the form of sovereigns' rights of foreign nations with all international implications and consequences. We had experienced one horrible incident when Italy sneaked into our Sovereign power by buying from a private owner Rubattino Shipping Company some land bought earlier [1869] from a local tribal chief as trading post (real estate) on the Red Sea coast. Even though there is a distinct difference at law between "sovereignty' and "property" that distinction is just academic when the owner of that property is a "Sovereign" entity. The dispute in such conflicts between two sovereigns claiming sovereign power over a single property becomes quite murky and vague allowing for all kinds of legal maneuvering.



If we go down that route, which I do not favor at all, may be we could borrow from principle of Comity and also from the concept of parity to counter the full impact of the slippery slop of losing Ethiopian sovereignty due to the joint ownership of the Renaissance Dam. It is far more justifiable for Ethiopia to claim joint ownership of Merowe Dam in Sudan, and Aswan Dam in Egypt than the suggested Sudan and Egypt's joint ownership of the Renaissance Dam and by extension the Waters of the Blue Nile. After all, the fertile highland soil of Ethiopia carried down by the Blue Nile for thousands of years gave life to Egypt itself. If we go that far, it will only be fair that Ethiopia jointly with Egypt own the Suez Canal too. If we allow the current Ethiopian Government logic, then we should also have joint ownership of Egypt itself. If we go that far, why not form one whole country made up of Egypt, Sudan, and Ethiopia. Well, while we are at it, we can add Somalia, Kenya, Uganda may be all the way to South Africa in this form of new fraternity of African States. We might as well create the "United States of Africa."

IV. Unchartered legal minefield

The literature on joint ownership of dams is quite limited. From about three thousand treaties and agreements dealing with the navigation and non-navigation use of waterways and international rivers, only a handful deal with dams. Even then, the record of the legal and political problems surrounding such jointly owned dams ought to raise a red flag for Ethiopia. Even within African nations involved in joint ownership of dams there are some serious conflicts of equitable sharing of both water and generated hydropower. In South America all of the jointly owned Dams are the sources of serious conflicts. The same types of conflicting interests of joint owners of dams in Africa are also similar causes of conflicts as is the case with their counterparts in South America.

One must study carefully the cases of joint ownerships of dams indicated here in below, before jumping into a minefield of legal controversies by creating a joint ownership of the Great Renaissance Dam and the Blue Nile and its Basin.

- 1. Senegal/Gambia Dams contentious relationship a far cry from a harmonious state cooperation.
- 2. Cahora Bassa Dam, Mozambique/South Africa -
- 3. The Kariba Dam, Zambia/Zembabwe
- 4. Salto Grande Argentina and Uruguay
- 5. Yacireta Dam Argentina and Paraguay



- 6. Itaipu Brazil shared with Paraguay
- 7. Narva Reservoir (Russia shared with Estonia)

Ethiopia is very new in the construction of mega dam buildings. Joint ownership of dams and other sovereign assets is a very complex and risky processes. One must learn from the experiences of other states that have traveled down that risky road. Thus, Ethiopia must develop its own expertise and avoid the continued dependence on foreign advisers and experts. This is a task that takes up time, but can be accelerated by mobilizing capable and well qualified Ethiopians in the Diaspora. Even more lacking is old fashioned Ethiopian patriotism and nationalism. I am quite certain about the extent of my own commitment to Ethiopia, I am not sure that I see the type of patriotic commitment in most of the political leaders both in the Diaspora or back home in Ethiopia. What I witnessed so far is divisive and ethnic based fractured leadership that is eating the very core of our continued survival.

V. On Ethiopian Patriotism and National Security

I do not know to what extent the current Ethiopian Government officials are patriotic or nationalist in the context of the current crisis surrounding the construction of the Renaissance Dam on the Blue Nile. However, I can point out that their recent dance with wolves does not show much of patriotic zeal. I cannot discount also the fact that they have very well learned advisors surrounding them. However, despite my goodwill and favorable disposition to the new Ethiopian Government, I do not feel comfortable in entrusting such monumental task dealing with Ethiopian Sovereignty and territorial integrity to any of them. The shadow of Meles Zenawi still seems to eclipse the new Ethiopian Leaders impeding their independence and the full commitment to Ethiopia's Sovereignty and territorial integrity. In short, I need more reassurance with clear policy that enshrines the Sovereignty and territorial integrity of Ethiopia. This is one time, despite my previous sever criticism of Emperor Tewodros, that I longed for a Tewodros to come to our rescue.

Nevertheless, it will be a mistake to equate intelligence with patriotism or nationalism. Meles Zenawi left us with a legacy that truly had undermined Ethiopian patriotism and Ethiopian nationalism. The "pragmatism" he expounded had always bordered treason when it relates to boundary disputes, national security et cetera. We saw it happen early in his leadership signing away Eritrea and the Ethiopian coastal territories, and signing up an arbitration agreement under defunct colonial treaties resurrected to give life to an independent "Eritrea." It was during his watch that Ethiopia became landlocked without a coast or coastal waters. To this day, we do not know what arrangements and



territorial concessions he had made with the Sudan to get their cooperation on the construction of the Renaissance Dam. Whatever it is, we must have paid too steep a price. Soon enough we will find out the extent and scope of our loss in our Sovereignty and territorial integrity.

One other legacy of Meles Zenawi is the fanatical steps he took to hide what he had done in his bid for international recognition that affected Ethiopian sovereignty and territorial integrity. No one knows much about the agreements Ethiopian officials signed that are the basis of our relationships with foreign states such as China, Egypt, Kenya, Sudan et cetera. There are no timely press releases about negotiations or draft agreements before the signing of such agreements by the Ethiopian Government officials. There is no set mechanism for public debate on issues of international agreements or relations with foreign governments. The people of Ethiopia have no access to read treaties entered by the Government of Ethiopia. There is no official publication devoted to inform the people of Ethiopia the types of international duties and obligations the Ethiopian State is entering into.

This essay was not meant to be this long. It was meant just to raise some critical issues and open a forum for discourse and sharing of views. The issues and historical background are very complex and extensive. I hope that readers would see this article as prompt rather than a definitive and exhaustive treatment of the subject matter. Thank you all. Long Live Ethiopia.

"Ethiopia and Sovereignty over the Blue Nile", Tecola W. Hagos, 03/11/2013, online at: http://www.abugidainfo.com/index.php/21998/

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Egypt: Sudan, Egypt, Ethiopia Agree to Collaborate On Dam Issue

Sudan, Egypt and Ethiopia on Monday reiterated commitment to joint coordination and constructive dialogue to reach consensus on the Great Ethiopian Renaissance Dam according to recommendations by an international panel that groups experts from the three countries.

A meeting for the ministers of water resources of the eastern Nile Basin countries, Sudan, Egypt and Ethiopia, started in the Sudanese capital Khartoum on Monday to reactivate and follow up the implementation of the recommendations of the International Panel-of-Experts (IPOE), tasked with assessing the impacts of the Ethiopian dam on the two countries of the Nile Basin mainstream (Sudan and Egypt).

Sudan's Minister of Water Resources and Electricity Osama Abdallah said that "this meeting comes at a historical phase of the cooperation among our countries and communities as today we are looking into how to implement the recommendations of the IPOE on the renaissance dam."

"The peoples of the eastern Nile Basin countries are looking forward for further fruitful and constructive cooperation for better exploitation of the water resources in the eastern basin for the prosperity of their peoples," he added.

He reiterated Sudan's commitment to seriously and fully cooperate with the Nile Basin countries, saying "We hope our efforts would lead to reaching the suitable mechanisms that enable us to press ahead with the implementation of the IPOE recommendations."

Egyptian Minister of Water Resources and Irrigation Mohamed Abdul Muttalib said that "It is high time to consider a new strategy in order to attain the best opportunity for the best interest of our children and future generations."

The Egyptian minister further reiterated that cooperation and coordination are the best ways for achieving the desired development goals of the Nile Basin Region, expressing hope that the outcomes of the meeting would provide a concrete ground to start a new era of cooperation among the three countries.



Ethiopian Water and Energy Minister Almayehu Tegenu said "The decision by the people and government of Ethiopia to launch the construction of the dam is a response to our national development objectives and a firm commitment to regional integrated and sustainable cooperation."

He stressed the importance of building trust and confidence and promoting cooperation among the three eastern Nile Basin countries.

He further noted that the Ethiopian government has accepted the IPOE report on the dam, reiterating his country's keenness to construct the dam according to the international standards and not to harm the interests of the eastern Nile Basin countries.

The meeting is expected to issue a final communique at the end of the talks between the three countries.

The IPOE concluded its task last May and submitted its report to the governments of the three countries which agreed to convene the current meeting to discuss a mechanism to implement the panel recommendations.

"Egypt: Sudan, Egypt, Ethiopia Agree to Collaborate On Dam Issue", 05/11/2013, online at: http://allafrica.com/stories/201311051199.html

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• Egypt and Ethiopia Disagree on Probe of Nile Dam Impact

<u>Egypt</u> called for international experts to help prepare a new study on the regional impact of a 4.2 billion dam in <u>Ethiopia</u>, which said a team made up of officials from the two nations and<u>Sudan</u> is enough.

Egypt wants "trusted international consultancies" to look into how the hydropower project on a tributary of the Nile River will affect the waterway's flow well as safety issues, Egyptian Irrigation Minister Mohamed Abdel-Moteleb said after meeting his Sudanese and Ethiopian counterparts in Sudan's capital, Khartoum, on Nov. 4. Ethiopian Water and Energy Minister Alemayehu Tegenu said including such a group was unnecessary after global experts completed a report earlier this year.

"We didn't agree on the composition of the established committee," Alemayehu told reporters yesterday in Khartoum. "We don't have any difference with the Sudanese, the difference we have is with the Egyptians."

The 6,000-megawatt Grand Ethiopian Renaissance Dam, set to be <u>Africa</u>'s largest when its completed in 2017, has raised concern in Cairo that it will reduce the flow of the Nile, which provides almost all of Egypt's water. Ethiopia's government has said it won't pause construction or scale down the country's most important development project. Sudan backs the dam, which will bring "many blessings and benefits for us," Information Minister Ahmed Bilal Osman said in June.

'Basic' Analysis

In a June report, a group of international experts said Ethiopia's analysis of the dam's downstream impact during filling and operation was "very basic, and not yet at a level of detail, sophistication and reliability that would befit a development of this magnitude, importance and with such regional impact." This week's meeting was to discuss ways of acting on the report's recommendations.

Egypt wants scientists from neutral countries to be involved in assessing issues including the dam's dimensions, how it will be filled and discharged and "what will happen if it collapses," Abdel-Moteleb said. The international experts' report said that Ethiopia hadn't presented analysis of the consequences of a dam collapse, although officials informed them a study was being undertaken.

Ethiopia and Sudan don't think a panel with neutral representatives is needed to hire and oversee consultants to conduct studies recommended by experts in June, Fekahmed Negash, head of the



Ethiopian Water Ministry's Boundary and Transboundary Rivers Affairs Directorate, said by phone from Addis Ababa today. "The countries can handle it," he said.

Officials will meet in the Sudanese capital again on Dec. 8 to try and resolve the issue, Alemayehu said.

Ethiopia is the source of 86 percent of the water that flows into the Nile, the world's longest river that runs 4,160 miles through 11 countries from Burundi in the south to Egypt, where it empties into the Mediterranean Sea.

"Egypt and Ethiopia Disagree on Probe of Nile Dam Impact", 06/11/2013, online at: http://www.bloomberg.com/news/2013-11-06/egypt-and-ethiopia-disagree-on-probe-of-nile-damimpact.html?utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=aa37e6102d-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-aa37e6102d-250657169

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Region needs to tackle water scarcity

With new predictions that water scarcity in the Middle East will worsen, conserving groundwater resources as part of a water security strategy is becoming more urgent, say the organisers of next year's International Water Summit.

A recent study by the Potsdam Institute for Climate Impact and Research, published in the journal Environmental Research Letters, argues that an expected rise of 3.5°C in global mean temperature by the end of the century will expose 668 million people worldwide to new or aggravated water scarcity, on top of the 1.3 billion currently living in water-scarce regions.

The problem will be even more severe in arid regions such as the Middle East with these expected changes in climate delivering less rain and further diminishing the availability of scarce groundwater resources.

The organisers of the International Water Summit have said that conserving groundwater resources will be a key focus of next year's summit, which takes place from 20-22 January in Abu Dhabi as part of Abu Dhabi Sustainability Week (ADSW). It made the point that groundwater resources account for 63.3% of all the water resources in Abu Dhabi.

Ara Fernezian, Reed Exhibitions' Middle East managing director, said: "Conserving groundwater is a major social and environmental issue across the region, and the new predictions outlined in recent studies shows the issues will get worse if urgent action is not taken.

"However, it also opens a range of commercial opportunities, with over \$300bn of investment on water projects being planned by governments in GCC countries by 2022. The Sustainable Water Solutions Village at IWS 2014 will provide many successful ideas for investing in and managing these projects to address the water scarcity challenges."

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[&]quot;Region needs to tackle water scarcity", 07/11/2013, online at: <u>http://www.constructionweekonline.com/article-24995-region-needs-to-tackle-water-scarcity/#.Un-AmXByszF</u>



* Zeidan opens National Water Conference

Prime Minister Ali Zeidan opened Tripoli's three-day National Water Conference this morning, saying that the country's water resources were a huge concern.

Sebha was crucial to water resource politics in the future, he said, adding that Sebha and Tripoli, in particular, needed improved political cohesion.

One of the main pumping stations for the Man-Made River is located near Sebha. In September, tribesmen <u>stopped the pumping</u> in protest over the abduction of Anoud Senussi, cutting the water supply to western Libya and leaving much of the capital without water for nearly ten days. Minister of Water Resources, Hadi Hinshir, said that it was a happy coincidence that the opening of

the Water Conference had fallen on the first day of the Islamic New Year.

It was vital that the country's limited water resources should be preserved and protected, Hinshir said. He added that he hoped the conference, which brings together Libyan and international water resources scientists and experts, would result in some good ideas for the future of the country's water resources.

A range of scientific papers will be given at the conference, including on sustainable water desalination and the affect of fossil groundwater abstraction on the environment. Several present findings about the detection of the Coliform Group of bacteria, which includes e-coli, in drinking water samples from wells in Sebha and in bottled water in Benghazi.

The National Water Conference is being sponsored by the Ministry of Water Resources and the Libya Society for Earth Sciences.

The conference is being held at Tripoli's Dat Alemad (Five Towers) Complex. Anyone interested in water resources is welcome to attend.

"Zeidan opens National Water Conference", 07/11/2013, online at: <u>http://www.libyaherald.com/2013/11/05/zeidan-opens-national-water-conference/#axz2kKA6cFI7</u>

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Farmer managed irrigation systems in the Alai (Kyrgyzstan) and Pamir (Tajikistan) mountains

In the high mountain valleys of Kyrgyzstan and Tajikistan, gravity-flow irrigation systems support the production of grains, fodder, vegetables, herbs, and fruits as well as wood for construction purposes. A majority of the irrigation systems in the Alai and Pamir mountain ranges were constructed by communities of water users prior to or in the decades following the entrance to the region of Tsarist Russia in the late 19th century, though some have been subsequently developed with or without government and non-government organization (NGO) support.

The Soviet Union transformed agriculture by collectivizing landholdings and organizing workers into Kolkhozes (collective farms) and Sovkhozes (state farms). These institutions were formally responsible for water distribution and the maintenance of canals, and provided funds to this end. Following the collapse of the Soviet Union in the 1990s land redistribution took place on a village by village basis. Plots of land of different quality and in different locations were allocated to individuals, not households, which resulted in significant variations in household landholdings, both within and across villages.

Upon independence in 1991, both Tajikistan and Kyrgyzstan: inherited a deteriorated water infrastructure, a shortage of financial means and professional capabilities, a hierarchal governance system inadequate to meet new challenges, and a need to develop their own water governance policy strategy.1 Both countries were influenced by the same international trends in the water sector, resulting in policy decisions in the 1990s and 2000s introducing water codes, irrigation service fees, and the transfer of irrigation management to water user associations (WUAs). Notably, WUA reform has almost exclusively been implemented by international NGOs and donors, e.g. the World Bank and Asian Development Bank.¹ Despite these national policy shifts, WUA formation has hardly been implemented in the high elevation regions of Tajikistan and Kyrgyzstan, which are seen (by policy makers) to be less agriculturally productive, hence less important than lowland regions.

In both newly independent countries, formal local governments have been introduced: the *jamoat* in Tajikistan and the*aiyl okmotu* in Kyrgyzstan. These local government structures, which have extremely limited budgets, function alongside informal political institutions dating back to pre-Soviet



times, such as the *rais* (village headman) in Tajikistan and the *sud aksakalov* (court of elders) in Kyrgyzstan.

Where WUAs have been formed, their spatial scale matches that of the *jamoat* or *aiyl okmotu*. Similar characteristics are shared by WUAs in both Gorno-Badakhshan province of Tajikistan and Osh province of Kyrgyzstan: their functionaries work at administrative not hydrological (or irrigation system) levels, and there is little if any government funding such that, aside from the funds that can be raised from water users, WUAs are reliant on funding from international NGOs and donors.

In a recent study², I undertook fieldwork in several *aiyl okmotus* and *jamoats* in November 2011 and April-June 2012. A case study approach to irrigation systems was pursued that included observation, mapping of irrigation systems and farmland, and interviews. Data was also collected from government and NGO offices in the provinces' capitals and district head-quarters. The study did not seek to perform a comparative analysis across research sites and, therefore, they were not selected with the intention that they should be directly comparable.

The findings of the research were considered in light of the conceptual distinction made in the literature between hydraulic, conferred, and claimed tenure arrangements in irrigation. Hydraulic tenure arrangements relate to the rights to use water and partake in management decisions, as well as the obligations towards the maintenance of irrigation systems, all of which are developed during the initial construction (property creation) and through the use and maintenance of irrigation systems.³ Such arrangements may not persist if major land reforms are enacted. Agrarian reform can introduce systems of conferred tenure, wherein rights are granted to households or communities, and/or claimed tenure, wherein workers of collective farms or estates claim water and land rights.⁴

This research indicates that the distinction between hydraulic, conferred, and claimed tenure arrangements in irrigation does not hold well for the river valley and slope offtake irrigation systems of the upper Tar and Shokhdara valleys, in Osh and Gorno-Badakhshan provinces respectively. Where irrigation systems serve private household plots that have remained with families through the Soviet period to the present day, normative and organizational arrangements to some extent adhere to the idea of hydraulic tenure. However, water rights and attached obligations have altered significantly



over time due to the colonization of new land, rise in the number of households, and changing attitudes and livelihood options, particularly out-migration since the collapse of the USSR.

A mixture of two or three of the tenure arrangements is found to influence the normative and organizational arrangements for irrigation management. Rights were conferred by the state, but in the process certain rights were likely claimed by particular households with reference to earlier (hydraulic) tenure arrangements and in accordance with local notions of equity. Such a complex reshuffling of rights to land and water cannot be easily captured in a simple conceptual model.

The research also illustrates that rights (the particulars of which include privileges, restrictions, obligations, and sanctions) have to be enforced by an authority, whose recognition and legitimacy can stem from one or more socio-legal system. These authorities can include officials from the local government structures, *aksakals* (elders in Kyrgyzstan) and *rais* (village headmen, in Tajikistan). The socio-legal systems drawn upon by authoritative figures include informal norms and local power structures, provincial or national law, and projects and concepts introduced by NGOs. For example, in 2011 and by his own initiative, the *rais* of the research village in Gorno-Badakhshan – who is the great-grandson of the former ruler of his valley, showing a continuation in local power structures over time – formed a WUA in his village inspired by a model promoted by USAID.

The research concludes that the changes occurring in the collective management of hill irrigation systems in the valleys of the Alai and Pamir mountains are in many ways similar to those experienced slightly earlier in the Andes⁵, in China's West Sichuan and Xizang⁶, and in Pakistan's Karakorum⁷. This suggests that an analysis of natural resource management challenges in post-Soviet countries should look across traditional area studies regions, rather than focusing solely on literature pertaining to the former USSR.

It also suggests that an appreciation of the heterogeneous forms of authority in irrigation management, rather than the privileging of externally created formal institutions, is required for government and nongovernment agencies to support hill irrigation and mountain agriculture.

Further research in this area is required to understand a) how and why NGOs and donors target certain villages, b) how communities and co-existing authorities resolve conflicts and take decisions,



and c) how irrigation rules are being modified by communities in light of social and environmental change.

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"Farmer managed irrigation systems in the Alai (Kyrgyzstan) and Pamir (Tajikistan) mountains", Dr. Joe Hill, Center for Development Research (ZEF), University of Bonn, Germany, 04/11/2013, online at: http://www.globalwaterforum.org/2013/11/04/farmer-managed-irrigation-systems-in-the-alai-kyrgyzstan-and-pamir-tajikistan-mountains/

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* Moratorium Needed on Mekong River Dams

Few development schemes pose more serious risks to food security, fisheries, and aquatic ecosystems than the construction of proposed hydropower dams on the main channel of the Mekong River in Southeast Asia.

Three years ago, in an environmental assessment of those proposed dams, the Mekong River Commission – the body that oversees regional cooperation in the Mekong Basin – recommended that dam construction on the Mekong be halted for ten years to allow time for further study of their impacts and proper consultation among the lower-basin countries – Laos, Thailand, Cambodia and Vietnam.

But with work on the Xayaburi Dam in northern Laos now underway, and the Laotian government's announcement five weeks ago that it intends to proceed with another dam near the Cambodian border, the time has come for the MRC and the international community to take more assertive action to bring a moratorium into effect.

Hanging in the balance are the livelihoods of millions of people, the continued existence of one of the world's most productive fisheries, the prospects for equitable and sustainable development in the region, and, quite possibly, regional peace and stability.

The River that Keeps Giving

Rising on the Tibetan Plateau, the Mekong River runs approximately 4,400 kilometers (2,700 miles) through China, Burma, and the four lower-basin countries before emptying into the South China Sea. More than 60 million people in the lower basin depend on the Mekong for their food security and livelihoods.

The Mekong yields a wild fish catch of some 2.2 million tons a year, providing crucial protein for the region's inhabitants. The nutrients the river carries downstream nourish floodplain farms that produce vital crops during the dry season, as well as fertilizing the Mekong Delta, the rice bowl of Vietnam.

Home to at least 500 species of fish – and some estimates run upwards of 1,000 – the Mekong ranks just behind the Amazon in terms of fish diversity. The critically endangered <u>Mekong giant catfish</u>,



one of the largest fish in the world, migrates hundreds of kilometers between its rearing and spawning grounds, which scientists believe to be in Laos and northern Thailand. Perhaps only a few hundred of these Mekong giants remain.

"We know very little about the ecology of these species and what we do know suggests that they need healthy, free-flowing rivers to survive," <u>according to</u> Zeb Hogan, a biologist at the University of Nevada and head of National Geographic's <u>Megafishes Project</u>.

The Mekong also sustains the <u>Tonle Sap</u>, the largest freshwater lake in Southeast Asia and the source of 75 percent of Cambodia's inland fish production. Home to more than 200 species of fish, 23 species of snakes, and 13 species of turtles, the Tonle Sap is an ecological hotspot and<u>a designated</u> <u>UN Biosphere Reserve</u>. Scientists believe the Mekong giant catfish rear primarily in the Tonle Sap.

Weighing the Tradeoffs

With energy demand in the lower Mekong basin expected to triple or quadruple by 2025, there is clearly a need for more power generation capacity in the region.

Eleven hydroelectric dams have been proposed for the lower Mekong – nine in Laos and two in Cambodia.

The first to go under construction is the Xayaburi, and although Laotian officials <u>have variously</u> <u>said</u> that only preparatory work is under way, that work on the dam had been suspended, and that construction will not begin until after consultations with its neighboring countries, visits to the dam site suggest work is indeed under way.

After a trip to the site in June 2012, the non-governmental organization <u>International Rivers</u>posted a series of photographs showing the river being dredged and widened.

Xayaburi is expected to cost \$3.5 billion and take eight years to build. About 95 percent of the power generated by the dam is slated for export to Thailand. Four Thai banks <u>are financing</u> the project.

"The Xayaburi dam is a dangerous experiment," Dr. Jian-hua Meng, Sustainable Hydropower Specialist with the World Wildlife Fund (WWF) was quoted as saying in a <u>news release</u>.

"The risk to fisheries, fish migration and impacts from sediment effects are immense, and the consequences for downstream countries dire. There are 11 dams planned on the lower mainstream of the Mekong, and the region can't afford to get a single one wrong."



The tragedy is that with more careful study and examination of alternative sites and power sources, much of the damage from Xayaburi and other dams on the Mekong's main channel might be avoided, while still meeting energy demands.

The Mekong River Commission (MRC) <u>estimates</u> that, if built, the mainstream dams would together meet 6-8 percent of the projected lower Mekong basin power demand in 2025.

"There are locations on the Mekong that are suitable for genuinely sustainable hydropower,"<u>said</u> WWF's Jian-hua Meng, "but the Lower Mekong countries must urgently get the MRC back on track to broker those negotiations and fill the major science and data gaps, or risk building dams by guesswork."

In the wake of the September 30^{th} decision by Laos to proceed with the Don Sahong Dam – which will block the only channel available for dry-season fish migrations on the Mekong –WWF has <u>called</u> for an emergency meeting of the MRC.

Time to Act

The Mekong River Commission's environmental assessment finds that the eleven proposed hydroelectric dams would "fundamentally affect the integrity and the productivity of the Mekong aquatic system," including a 12-27 percent reduction in primary productivity, a 75 percent reduction in nutrient loading, and the likely extinction of a number of globally endangered species.

In addition to noting that alternatives to damming the Mekong main channel have not been adequately explored, the MRC assessment finds that the dam projects would likely worsen poverty and inequality in the lower Mekong basin countries, and degrade the livelihoods of the poorest communities along the river.

The MRC assessment recommends that decisions on the mainstream dams be deferred for ten years, with reviews every three years to ensure that the studies and consultations needed to make informed decisions are, in fact, taking place.

With the Xayaburi Dam under way, and the Don Sahong Dam slated to begin soon, the government of Laos is not abiding by the MRC's process of notification, prior consultation and agreement.



During a visit to Laos in July 2012, then U.S. Secretary of State Hillary Clinton <u>pushed the</u> <u>government to further study</u> the impacts of the Xayaburi Dam on its downstream neighbors before proceeding.

Clearly, more international pressure and stronger action from the MRC are needed.

The full potential of the Mekong can only be realized if the countries joined by the river work collaboratively to maximize and share its full range of benefits for this and future generations.

A moratorium on dam construction of at least a decade is needed to begin and solidify this process.

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"Moratorium Needed on Mekong River Dams", 07/11/2013, online at: http://newswatch.nationalgeographic.com/2013/11/07/moratorium-needed-on-mekong-river-dams/

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* New Mekong dam will soon wipe out endangered Irawaddy dolphin, enviros say

Poverty-stricken Laos needs the money and energy, but the Si Phan Don dam threatens ecosystems and the livelihoods of millions.

SI PHAN DON, Laos — They might not be as adventurous as Flipper, but every couple minutes the light gray head and back of a freshwater dolphin breaches the surface.

These aren't trained sea mammals in a theme park. We're in southern Laos on the mighty Mekong, Southeast <u>Asia</u>'s powerhouse river. Globally, it's second only to the Amazon in fish diversity.

The Mekong is also the natural habitat of the endangered Irrawaddy dolphin.

The 4,000 islands region, as it's known, is home to one of world's biggest Irrawaddy dolphin pools — a whopping 11 individuals.

Foreigners come to munch fried rice, dangle their feet in the tepid chocolate-colored waters and watch these vanishing mammals swim just 50 feet from the riverside. Set amid the lush rain forest, emerald rice fields, homes on stilts and golden-roofed Buddhist pagodas, it's hardly surprising that this region is attracting tourists.

At least for the moment.

With the hush of waterfalls in the back, it's a sublime experience, even for locals like Kem At, who operates a slow-moving tour boat big enough for 10 tourists to squeeze in.

"The Mekong dolphin doesn't jump," At patiently tells tourists, smiling as he watches one of the dolphins cut the surface.

This month, workers will begin constructing a 100-foot-high, 256-megawatt dam that will eventually tower over the river, according to a communiqué filed by the Communist government.

Within the next year, scientists say, these dolphins will almost certainly be wiped out. Soon after, millions of fish in southern Laos will perish as well.

Environmentalists contend that the dam will threaten the livelihood of about 60 million people in Laos, <u>Thailand</u>, Cambodia and <u>Vietnam</u>, who depend on the Lower Mekong as a main source of income, nutrients and cultural identity.



The dolphins, said Ame Trandem, Southeast Asia program director at advocacy group International Rivers, would be the first ones to feel the impact, as 95,000 truckloads of sediment are removed to build the dam, changing the hydrological balance of the Mekong.

It is unlikely that they will be able to adapt, she said.

"The dolphins are extremely sensitive so these changes will likely lead to their extinction — definitely for the area, possibly for the whole river," Trandem said.

Little more than a mile north of the dam, the Khone Phapheng waterfalls, the largest in Southeast Asia, will be robbed of much of its water, Trandem said. Eventually the falls, which are the region's major attraction aside from the dolphins, would draw fewer tourists as well.

The dam will also block migratory fish — which make up 70 percent of Mekong fish — from swimming up and down the Mekong.

"The Don Sahong will be built on the only channel where fish can migrate year round," she added. "That's why it's so risky to build it here, where there's a maximum concentration of fish. It's located on the worst imaginable channel."

Laos, one of east Asia's poorest countries, has been working for two decades on plans to construct a total of nine dams on the Mekong. Although electricity is available throughout the 4,000 islands, most locals live in wooden, one-room huts on less than \$1 per day. Light bulbs are an unaffordable luxury. For the most part, locals are off the grid.

So far, only construction on the \$3.8 billion Xayaburi, in northern Laos, is under way. The Don Sahong, which is located only 1 mile from the border with Cambodia, however, will have a much larger impact on migratory fish.

"The Xayaburi will have an impact on fisheries but not to the same degree as Don Sahong. A lot of fish come from the Tonle Sap [lake and river in Cambodia] and migrate up and they can't do that anymore," Trandem said.

Although the Don Sahong will be constructed and later operated by the Malaysia-based Mega First Corporation Berhard, the project's director, Yeong Chee Neang, said that the electricity will be sold to the Lao government.


Concerns over the dam's impacts, Chee Neang said, were unnecessary fear mongering.

"It will be better because the dam will make it possible for fish to swim up and down, and that has been proven by our consultants and experts," he said, adding that fish would use fish passages the company intended to build on nearby channels.

A letter sent by 34 international scientists to the Lao government in 2007, however, said that the dam's impact on fisheries and human livelihoods would "far exceed the net return from the project," and that it was not in the best interest of the people of Laos, Thailand, Cambodia and Vietnam.

Ian Baird, an assistant professor of geography at the University of Wisconsin-Madison, who helped coordinate the letter, wrote in his research that nutritional impacts would hit the already malnourished fishermen and their families hard.

"The [Don Sahong] would cause serious human nutritional problems throughout the Mekong Region, as wild-caught fish are the most important source of animal protein for people living along large rivers and streams in the basin. In addition, decreasing availability of fish in the marketplace would lead to higher prices, reducing fish consumption, especially by poorer consumers unable to afford fish," he wrote.

For most locals and the thousands of fishermen in the area, the change is hard to imagine. Perhaps the fish will find an alternate channel to migrate, and perhaps the dolphins will survive.

"They [dolphins] have always been here," At said, smiling as another dolphin popped up. "They can't be gone."

"New Mekong dam will soon wipe out endangered Irawaddy dolphin, enviros say", 05/11/2013, online at: <u>http://www.globalpost.com/dispatch/news/regions/asia-pacific/131031/mekong-dam-threatens-endangered-irawaddy-dolphin</u>

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* Tanzania becomes latest battleground for GM food supporters and opponents

US and European groups are at odds over genetically modified foods being introduced in Africa

When the bell rang at midday, students fetched tin bowls and lined up under trees in the schoolyard for scoops of corn and bean porridge. Not one of them displayed the food fussiness often seen in American school lunch lines. After the rainy seasons short-changed Engaruka, a Maasai village in northern <u>Tanzania</u>, children here suffered too many days when there was no porridge – no food at all to eat in their mud-and-stick huts. Drought is to blame.

Scientists are developing drought-tolerant corn, something that could ease hunger across Tanzania and sub-Saharan <u>Africa</u>. But the corn can't be planted here because it was genetically modified. Opponents of genetically modified crops have made a stand in Africa – and now villages like Engaruka are squarely in the middle of a global ideological war over agricultural technology.

Since US farmers first adopted genetically modified (GM) crops in 1996, 17 million farmers in 29 countries have followed suit. Europe rejected the crops, though, arguing that farmers would be exploited by large seed companies and that more research is needed into possible risks to the environment and food safety. And European activists have pressured Africa to do the same. Just four African countries – Sudan, Egypt, Burkina Faso and South Africa – have allowed them. No one denies Africa's hunger. World crop production has more than doubled in 50 years, according to the Food and Agriculture Organisation. But Africa lagged behind, achieving some gains while losing ground in places like Engaruka where drought, plant diseases and other problems have knocked down yields and depleted the available food. Now that problem takes on new urgency with UN projections that Africa's population will quadruple by the end of this century.

The question of which approach is best for Africa remains hotly disputed. It tears at Tanzania, where 80% of the people live by subsistence agriculture.

African countries and research organisations, working together in the<u>Water Efficient Maize for</u> <u>Africa</u> project, have incorporated a gene from a common soil bacterium into corn, enabling plants to produce kernels even while short of water. The modified corn is expected to increase yields by 25% during moderate drought. Tanzania is a member nation in the project. But regulations it adopted in 2009 have effectively blocked GM crops.

Under a "strict liability" rule, anyone associated with importing, moving, storing and using GM products is liable if someone makes a claim of harm, injury or loss caused by the products. Such a



claim could reach beyond personal loss or injury to include damage to the environment and to biological diversity. Under that policy, no research organisation has dared to introduce genetically modified crops into Tanzania's fields.

At Mikocheni Agricultural Research Institute in Dar es Salaam, plant virologist Joseph Ndunguru has genetically transformed cassava to resist viruses that are devastating the crop. Instead of starting field trials, Ndunguru is waiting for new regulations. "There is a lot of fear," he said.

As for water-efficient corn, Alois Kullaya said research has been on hold since 2009. He is Mikocheni's principal agricultural research officer and also the Tanzanian co-ordinator of the corn project. Tanzanian scientists have not been able to conduct field trials with the corn they have developed in laboratories.

The scientists have urged Tanzania's government to shift to a "fault-based" regulatory approach under which a heavier burden of proof would fall on someone claiming harm or injury.

Pushing the government from the other side is the <u>Tanzania Alliance for Biodiversity</u>, a coalition of environmental and organic <u>farming</u> groups. "Whoever introduces GM [crops] should be responsible for what happens on the ground," said Abdallah Mkindi, alliance co-ordinator. Mkindi said scientists serve as a front for multinational seed companies. If regulations were relaxed, he said, companies could hold small-scale farmers ransom, and <u>food security</u> would be threatened.

"Multinational companies are simply here to expand their business," Mkindi said. "GM is not a solution to famine."

Some coalition members argue that Africa's food sovereignty is at risk if its farmers accept seeds and plant cuttings created by large, outside organisations. Some also say that a hi-tech fix for Africa's food insecurity is a false promise given the many other problems begging to be addressed – including poor access to land, water, credit, agricultural extension services, roads and markets.

Of 19 alliance members, 11 are European-based groups or have European affiliations. The expert authority the alliance cites for claims about GM crops is from London-based Earth Open Source.

Beyond grassroots activism, Europeans have profoundly influenced African attitudes by rejecting genetically modified crops, Ndunguru said.



"People go to the internet, and they read the information put there by European anti-GM groups, and they ask, 'If this technology is safe, why don't the Europeans use it?" he said.

Now, some experts are accusing European activists of placing ideology above Africa's food security.

"Opposition to biotechnology in Africa started before there was much scientific research on the subject outside South Africa. So Africa's first import was opposition to the technology before the products got there," said Calestous Juma, a Harvard professor of international development and a native Kenyan. "This was because the [European Union] constructed a resistance industry and exported it through a variety of channels."

American advocates for GM crops have been busy in Africa, too. Support for the Water Efficient Maize project came from the US Agency for International Development as well as the Bill and Melinda Gates and the Howard G Buffett foundations. The project's drought-tolerance gene came from Monsanto, which has said the seeds will go royalty-free to African farmers. The project also produces conventionally bred corn.

Other GM research targeted for Africa is also backed by American money and knowhow. One target has been the vitamin A deficiency that causes blindness in millions of African children. Helen Keller International is involved in engineering orange-fleshed sweet potatoes to deliver extra helpings of the micronutrient that the body transforms into vitamin A. St Louis-based Donald Danforth Plant Science Centre is working in Kenya and Nigeria to boost that pro-vitamin A and other nutrients in cassava.

Another goal is to address deficiencies in the resources available to African farmers. Dupont Pioneer, for example, is helping develop corn that makes more efficient use of nitrogen so that farmers could get by with less fertiliser.

Behind the individual projects, GM foes suspect a conspiracy to slip American agribusiness into Africa. In 2012, the Obama administration prompted a flurry of suspicion when it used a G8 summit to announce the<u>new alliance for food security and nutrition</u>, with the goal of lifting 50 million Africans out of poverty by 2022.

A working group of the German Forum on Environment & Development reacted with a statement saying the initiative "paves the way for radical opening of markets for international seed and agrarian corporations in African countries". That response expressed the essence of the tension that persists



across Africa with US technology rolling forward against pushback from Europeans – and also from some like-minded Americans. The controversy flared again this year after the World Food Prize Foundation announced that its prestigious annual award would go to three scientists who laid the groundwork for today's GM crops 30 years ago by developing techniques for inserting foreign genes into the DNA of plants.

While the global debate rages, many families in Engaruka remain perilously close to starvation after recent droughts destroyed crops and killed 65% of the livestock.

Before 2009, Thomas Saitoti said he owned 30 cows. Now he has just two. His family lost its cushion against the next drought. They ran out of food in April and were saved by a government handout of corn.

In the next house, Juliana Saitoti sat shelling beans. Thanks to rain this year, her family had food in September, even eggs for the children. But, with the dry season, food would soon run out. "Then we will not have enough to eat," she said.

"Tanzania becomes latest battleground for GM food supporters and opponents", 05/11/2013, online at: http://www.theguardian.com/world/2013/nov/05/tanzania-battleground-gm-crops-foodsecurity?CMP=twt_fd&utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=aa37e6102d-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-aa37e6102d-250657169

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***** On Becoming China's Farm Team

Look at the <u>\$4.7 billion purchase</u> in September of the pork producer Smithfield Foods by Shuanghui International Holdings Ltd. -- the Chinese firm that counts Goldman Sachs among its backers -- from the standpoint of the Chinese. As this century's economic titan, they had to "take a position" in United States pork. China's population of nearly 1.4 billion is not only growing rapidly but growing wealthier rapidly, and flattering us by emulating our consumption patterns (for better or worse) while having trouble replicating some of our production systems.

China has notorious problems with food safety; urban Chinese consumers distrust the quality and safety of their own food system, and express clear preference for imported food when it is available. What to do when you are the largest pork supplier in China, you have production and quality problems, must meet the ravenous demand for more meat from hundreds of millions of paying consumers, and the international supply is abundant? You buy <u>the world's largest pork producer</u> and processor, together with that firm's vaunted supply chain, quality controls, brand value and consumer appeal.

Sadly, there may be only one potential upside to this deal for most Americans, and that one is ironic. We might see a marginal improvement in the quality of industrially produced pork by <u>ridding it of ractopamine</u>, a lean-meat growth stimulant whose effects on humans are <u>sufficiently questionable</u> that its use for meat production is illegal in the European Union, Russia and China. Smithfield says that as of June, <u>50 percent</u> of its pork is ractopamine-free, the better to please its new masters.

But can Americans buy Smithfield pork without ractopamine? Maybe, maybe not. At the moment, there's no way to know.

The other upsides are for the Chinese, and of course, Smithfield shareholders, though Smithfield executives would have you believe otherwise. Larry Pope, Smithfield's C.E.O., who is no doubt glowing about what turned out to be a \$34-per-share premium, was cheerleading in <u>his testimony</u> this past summer before the Senate committee on Agriculture, Nutrition and Forestry. He said that the purchase -- the biggest ever of a United States company by a Chinese one -- "provides enormous



benefits ... for American manufacturing and agriculture," and claims it will result in more production, jobs and exports.

"It'll be the same old Smithfield, only better," Mr. Pope said.

The Chinese produce and consume <u>half the world's pigs</u>. They have a pork strategic reserve not unlike our petroleum reserve. Really. They'll buy more pork from us when they can and need to, but not simply because a Chinese company owns the factory. (Would you, for example, be more likely to buy a Kia if Goldman Sachs bought the Korean carmaker? For that matter, can you be certain that they haven't?) If they did, and pork became scarcer, prices would climb; producers might consider that a good thing but consumers would not. Almost anything that reduces consumption of industrially produced meat is a plus, but reducing its production is equally important, and there's the rub, or one of them.

The benefits for Shuanghui are crystal clear: As is the case with 90 percent of the pork produced in the United States, almost all of Smithfield's "farms" use now standard techniques, including large (average: 2,000 pigs) concentrated animal feeding operations, or CAFOs, in which pigs are confined, fed with legal but problematic drugs and use enormous amounts of feed, water and energy while generating giant lagoons of manure. (That Smithfield has made some progress in manure disposal and even confinement are minor if not insignificant factors when the entire production model is assessed.)

Smithfield has also bred what might be the world's leanest and therefore most profitable pork, using genetic research paid for in part with tax dollars through <u>public support of research</u> at land-grant universities. Technologically speaking, the almost inconceivably huge Chinese pork industry is primitive. This is an instantaneous technology transfer that doesn't involve spying but cash.

Given what they just outsourced, why would the Chinese *not* want to buy the whole shebang? According to Kai Olson-Sawyer, a research and policy analyst at the Grace Communications Foundation who has <u>blogged extensively on this subject</u>, "The CAFO system has major impacts on environmental and human health, rural communities and animal welfare. And basically, taxpayers pay for it all: we subsidize the production of cheap grain used as feed, and are ultimately stuck bearing the environmental, public health and socioeconomic costs of industrial livestock production."



The fact is that China is going to be a net importer of food more or less forever: it's got a fifth of the world's population (and eats a fifth of the world's food), but only nine percent of its agricultural land and <u>scarce water resources</u>. (The average pig takes nearly <u>600 gallons of water</u> to produce a pound of meat.)

So even more than a technology grab, the Smithfield deal is a land and water grab. We still have the world's most enviable combination of arable land, rainfall and temperate weather, and there's no practical technological substitute for any of these. It's the consumption of these resources, along with the manure deposits, that make the Smithfield deal, to <u>paraphrase Warren Buffett</u>, a form of colonization by purchase rather than conquest. In short, the deal, as <u>Minxin Pei wrote</u> in Fortune, is "really about owning access to America's safe farmland and clean water supplies."

Put aside for a moment the arguments of those who see a better way to eat and produce food more sustainably. And put aside that most Americans remain ignorant of how food is produced and the effect that production has on land, water, energy and even climate. Just say this: all agriculture has impact, which means it uses resources and leaves behind waste. We implicitly accept some of that impact because we want, for example, the pork.

The Smithfield-Shuanghui deal guarantees China the pork while offloading the downsides (the "externalities") of pork production onto The Land of the Free. It guarantees us cropland devoted to chemical-dependent monoculture; continued overuse of water and other resources, none of which we can afford to squander; and great big stinking piles of manure. In sum, it transfers the environmental damage of large-scale pork production from China to the United States without even guaranteeing us pork with as few chemicals as that shipped to China.

Welcome to China's farm team.

"On Becoming China's Farm Team",05/11/2013, online at: <u>http://www.nytimes.com/2013/11/06/opinion/bittman-on-becoming-chinas-farm-</u>

<u>team.html?hp&rref=opinion&_r=1&utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=752</u> 915c64a-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-752915c64a-250657169&

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***** Restoring springs combats water scarcity in India's Himalayas

DEHRADUN, India (Thomson Reuters Foundation) - Nagarasu is a tiny village in the lap of the Himalayas. Located in the Chamoli district of Uttarakhand, it depends on two sources of water – streams which originate from mountain glaciers and underground springs.

Both sources of water are now declining, with streams dwindling as glaciers retreat and deforestation contributing to the drying of springs.

But an innovative effort to help villages in the semi-arid region overcome growing water scarcity, by identifying the recharge area of springs and then replanting them and constructing water-harvesting facilities, is now paying off.

Springs that had once died out have reappeared and the flow in remaining springs has increased, leaving the 2,000-some villagers living in the area with gurgling water year-round.

"Earlier it was difficult to carry out agriculture and a lot of our produce would be regularly spoiled due to uncertain supply of water. Now I regularly grow okra, bottle gourd, cabbage, tomato and chili," said Vikrum Singh, a resident of Nagarasu.

For Shanti Devi, improvements to the area's springs – including one very near her home - have spared her long walks every day to fetch water. She now uses the time saved, and the extra water available, to maintain a milk cow and sell some of the milk to supplement her income.

The spring recharging technology, worked out by the Himalayan Environmental Studies and Conservation Organisation (HESCO) along with the Mumbai-based Bhaba Atomic Research Centre (BARC), has so far been applied in only one catchment area. This has recharged 16 springs supplying water to five villages, all of them in Chamoli district in Uttarakhand.

But HESCO is now applying the technology in six more catchment areas— four of them in Uttarakhand and two in Himachal Pradesh. The programme is expected to recharge 68 springs, benefitting a population of about 50,000 in 100 villages.



PROTECTING CATCHMENTS

The effort to recharge springs relies on 'environmental isotope technology', in which water from drying springs is tested by the Bhaba Atomic Research Centre – which now has a local office - to determine its content of isotopes of hydrogen and oxygen. This isotope content gives an indication of the geology and altitude at the source of this water, and thus helps identify the catchment area.

Once the catchment is identified, water conservation and recharge structures are constructed at key points.

After the successful identification of recharge areas, we involved the local people to undertake social, engineering and vegetative measures for water conservation and recharging," said Vinod Khati, an engineer with HESCO.

Usually trenches about 15 to 30 cm deep and one to 20 metres long are dug alongside the mountain slopes to channel runoff into newly dug water retention ponds, where it can slowly percolate into the ground.

Catchment areas also are replanted with trees or other vegetation, and the area is protecting from grazing and tree harvesting. The vegetation helps hold rainwater, allowing it so slowly seep into the ground rather than running off.

Because the springs are located above homes and villages, "no pumping is needed, so there are no additional costs and no maintenance is required. Consequently the technology when applied on a wider scale can go a long way to provide a sustainable and low-cost solution to water scarcity in these areas," said Pankaj, a consultant who has worked with HESCO.

The problem of drying springs is an increasingly widespread one in the region. According to an earlier survey by HESCO, 30 percent of the springs in the region had almost dried up and an additional 45 percent were on the verge of going drying. The problem has affected 60 percent of the population of the region's mountain villages.



In Uttarakhand alone 10,000 out of 16,000 villages are burdened with water scarcity and only about 15 percent can use water for irrigation.

Deforestation of recharge areas has been a major reason that springs in the region are drying, experts said.

"Restoring springs combats water scarcity in India's Himalayas", 04/11/2013, online at: <u>http://www.trust.org/item/20131103221719-</u> <u>dcup3/?source=hptop&utm_source=Circle+of+Blue+WaterNews+%26+Alerts&utm_campaign=348b6a6390-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_c1265b6ed7-348b6a6390-250657169</u>

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Protecting the valley: Holistic water management plans are cheaper, safer

The Hudson Valley receives abundant rainfall, so we often take our drinking water for granted. But in recent years, short-term water-supply crises have become more prevalent here. Faced with shrinking municipal budgets, communities have begun to explore holistic policies of sustainable water management that favor conservation, efficiency improvements and green infrastructure projects over costly new major construction projects.

A safe, sufficient water supply is critical for ensuring residents' health and attracting new businesses and jobs. The valley's drinking water comes from a combination of sources: surface water (such as rivers, lakes and reservoirs) and groundwater. Optimizing the availability of these resources is the first step in improving the management of drinking-water systems. The second is implementing measures to meet increasing water demand that are less environmentally destructive, energyintensive and expensive than traditional infrastructure projects.

So-called green infrastructure uses vegetation, soils and natural processes to efficiently manage stormwater and provide environmental and community benefits. Stormwater runoff is a major potential water source. When rain falls on natural surfaces, nearly all of the water is filtered by soil and plants as it soaks into the ground, replenishing the local aquifer. More than 90 percent of rain that drops on impervious surfaces such as parking lots, streets and roofs doesn't get absorbed. Instead, it's captured by culverts and drains and sent rushing into nearby waterways, becoming a wasted resource.

Potential also exists to reduce water use without sacrificing economic productivity or quality of life. During the summer, lawn and garden watering alone increase America's residential water consumption from 10 to 50 percent. Reasonable restrictions, such as limiting lawn watering via an odd-even day system and restricting it to nighttime hours (to improve soil absorption and limit evaporation) can significantly reduce peak summer demand. In addition, the use of price signals, such as charging higher rates for increasing rates of consumption, and providing incentives and rebates for water-efficient fixtures, can dramatically lower water use. In the early 1990s, New York City adopted such policies and slashed residential water use by 40 percent in just a few years.

Finally, leaky municipal pipes result in the loss of large amounts of water — up to 45 percent in some cities. Though replacing this aging infrastructure requires investments, the water saved is essentially "free" water to the utility and, in many cases, would preclude the need for more expensive new construction.

For a cautionary tale of what could happen if a holistic water management plan is not adopted, look at Rockland County. Though average annual precipitation there hovers around 50 inches, a privately owned corporation has proposed building a \$180-million desalination plant to draw brackish water



from the Hudson River and treat it to supply drinking water. This is a startling plan. Because of its astronomical costs, high energy consumption and environmental effects, desalination is seen as a last resort for supplying water. It's typically used in arid climates such as the Middle East and western United States.

So how did desalination become a possibility in Rockland? Steady development over the last 40 years has increased water demand. At the same time, poor land-use planning has resulted in the proliferation of areas covered by pavement and rooftops, preventing the county's abundant rainfall from replenishing its aquifer. It's estimated that 14 billion gallons of runoff per year flows into the Hudson River. Much of this wastewater could be captured and reused to increase water supply.

At the same time, Rockland County's water use rises 25 percent in the summer, primarily because of outdoor lawn and garden watering. Conservation measures could decrease this peak demand significantly. Further, 16 percent of system water is lost through aging infrastructure. Reducing this leakage even marginally could make available millions of extra gallons per day. Adopted together, these measures could obviate the need for any new water supply source — at a fraction of the cost and without harming one of the Hudson's prime fish habitats.

Holistic water management plans are cheaper, more flexible and more sustainable than traditional supply-side strategies that seek to add capacity by building expensive new facilities. Scenic Hudson's guide, Revitalizing Hudson Riverfronts, offers a wealth of tools and techniques for communities to take advantage of all the steps discussed above, ensuring that we can continue to rely on fresh, healthy water reaching our taps at the lowest possible economic and environmental cost.

"Protecting the valley: Holistic water management plans are cheaper, safer", 03/11/2013, online at: <u>http://www.poughkeepsiejournal.com/article/20131103/NEWS04/311030015/Protecting-valley-Holistic-water-management-plans-cheaper-safer?nclick_check=1</u>

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