

# ORSAM

## ORSAM WATER BULLETIN

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**Issue 107** 

#### **ORSAM WATER BULLETIN**

17 December – 23 December 2012

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#### ✤ Iranian scientists make fresh water using solar energy

Researchers at Islamic Azad University made it to the production of a fresh-water-producing machine using solar energy; and a smart, unmanned, high-speed watercraft.

The machine absorbing atmosphere humidity in seaside cities and producing fresh water is one of Islamic Azad University researchers' innovations.

This machine is built in 3 trays, each with specific parts and equipments. Humid air enters the machine from the middle tray. Then, after the air passes through the cold sink used for condensation, the humidity is turned into water, and the dry air moves to the upper tray to enter the atmosphere after passing through a heat sink.

Next, after the water is disinfected by using a UV lamp, it is stored in the lower tray, where flavorants could be added to give the water a better taste.

The solar panel makes it possible to produce fresh water at times of earthquake and flood when there is no instant access to fresh water and no electricity around.

The design and production of a smart, unmanned, high-speed watercraft named Araiana with composite body is yet another of the Iranian researchers' projects.

High maneuverability, smart processing, live video transfer of the environment, and high escape speed are among the abilities of the watercraft with a water-jet propelling unit.

The watercraft's max speed is 30 knots, equal to 54 km, and the maneuvering speed is 25 knots, equal to 41 km.

The watercraft also enjoys smart processing and programming from the shore for missions, and is able to transfer videos live. Also, this type of the watercraft is able to carry a 4-kg load, and can be used in the military and tourist sections.

"Iranian scientists make fresh water using solar energy", 18/12/2012, online at: http://www.ghatreh.org/view/7929/Iranian-scientists-make-fresh-water-using-solar-energy

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WWW.ORSAM.ORG.TR

Mithat Paşa Caddesi 46/4 Kızılay-Ankara TURKEY Tel: +90(312)4302609 Fax: +90(312)4303948 orsam@orsam.org.tr



#### \* Iraqis suffer from effects of US biological weapons: Iran MP

An Iranian lawmaker says biological weapons used by the United States in Iraq have caused cancer among the people and defects in newborn babies.

"Water and soil in Iraq have been contaminated by the American biological weapons which have caused various diseases among the Iraqi people," Abed Fattahi said on Wednesday.

The Iranian lawmaker went on to say that Iraq's environment was adversely affected at the end of the US-led war which will continue to have impacts on the future of the Iraqi people.

Fattahi also noted that the United States' military campaigns in some Middle East countries have not only affected those countries but have also resulted in similar impacts on their neighboring states.

The MP said the flow of groundwater from Iraq to Iran has led to appearance of certain diseases in some parts of Iran whose main cause is the use of biological and uranium weapons in Iraq by the US army.

US-led forces attacked Iraq in 2003 and toppled Saddam Hussein on the pretext of possessing weapons of mass destruction. But no such weapons was ever discovered in Iraq. At the peak of the US-led military operations in Iraq, there were 170,000 US troops and more than 500 bases in Iraq.

All US troops left Iraq by the end of 2011, after nine years of occupation, as required by a 2008 bilateral security agreement between the two countries.

"Iraqis suffer from effects of US biological weapons: Iran MP", 20/12/2012, online at: http://www.presstv.ir/detail/2012/12/20/279220/iraqis-suffer-from-us-bioweapon-effects/

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#### \* Water Mission to Israel: Heading Over

It always plays out this way—a kernel of an idea starts the ball rolling, followed by months of increasingly refined planning, a flurry of activity in the endgame, and then it's GO time. I recall this operating rhythm well from my military days, and it's been the same over the past dozen-plus years working with startups.

This time, it's the Massachusetts Water Mission to Israel. What started as an unplanned conversation between Governor Deval Patrick and Israeli Water Cluster icon Booky Oren on the March 2011 MA-Israel trade mission has evolved over the past year into the <u>launch of a water cluster in Massachusetts</u> and now a high-impact water industry-specific trade mission. Plus or minus today, some 40 Massachusetts-based water researchers, executives, investors, and government leaders are finding their way to Tel Aviv, where the <u>five-day trade mission</u> will kick off Saturday night with a dinner in the Port of Tel Aviv.

Right now I am sitting in the United Club in Newark waiting for the 10:55pm overnight flight to Tel Aviv. I am here with Chris McIntire of <u>Xylem</u> and Gil Arie of <u>Foley Hoag</u>. Gil was born, raised, and spent the first part of his professional legal career in Israel and came to the U.S. in 1999. Chris is a seasoned international traveler and business executive, but this is actually his first trip to Israel. I have been to Israel a number of times over the years, both in my military days and for commercial purposes. So the three of us are really a cross section of the trip—each going to learn, to reconnect with old friends and, for Gil, family.

While the agenda is packed and will be exhausting, its density provides busy folks like Gil and Chris an efficient and impactful way to experience Israel, to learn from and contribute to their water expertise, and to hopefully create some long-lasting professional and personal relationships. These types of international outreach efforts are the key bridges that need to be built to enable Massachusetts-based innovations to have a truly global impact.

I will be writing a daily (at least) Travel Blog from the Trade Mission, sharing some of the highlights and insights. You can learn more about the <u>trade mission and delegation</u> and one of the main events, the <u>W.E.T. Revolution</u>. You can follow the delegation's activity on Twitter at #MWIM.



#### WATER RESEARCH PROGRAMME -Weekly Bulletin-

Finally, my personal thoughts go out to all the families in the lovely community of Newtown, CT. The collective mood of the airport and travelers is subdued as a result of the shooting, and one can hardly escape the TV coverage around the airport. When tragedies like this happen, it puts everything else in life in appropriate focus. It does compel us that are fortunate enough to not have been directly impacted to recommit to making the world—and our communities—a better, safer, and happier place.

"Water Mission to Israel: Heading Over", 15/12/2012, online at: https://mail.google.com/mail/?shva=1#inbox/13bab931bf563e0e

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#### **\*** Water Mission to Israel (Day 1): The Past and Present of the Israeli Water Story

I did say <u>it was going to be a packed schedule</u>, so here I am sitting down at 1am in Tel Aviv sharing the highlights of Day 1 of the Massachusetts-Israel Water Mission. The first 24 hours have been filled with a whirlwind of history, sights, and sounds, spending time with fellow delegates and lots of wonderful Israeli food. (You can follow the delegation's activity on Twitter at #MWIM.)

We started with our first group meal last night in Tel Aviv Port at a lovely restaurant called Boya which is rumored to be President Bill Clinton's favorite in the city—after the amazing desserts, I can believe it. It was a nice chance to get to meet the diverse and engaging collection of folks who make up the delegation.

The morning wake-up call came too early after the too-late dinner, but we were greeted by another full complement of Israeli breakfast food and a far-reaching talk about the Israeli water ecosystem by Oded Distel, Director of <u>Israel NewTech</u>. NewTech is a quasi-government group which helps facilitate cleantech innovation, and Oded focused not just on the spirit of innovation in Israel, but more so on the cultural and economic shifts needed to drive water innovation in any community or country—a common theme in any water discussion and a key lesson already learned for the entire delegation.

We then boarded the bus for <u>Caesarea</u> which was the seat of the Roman Empire in the region. On the drive there and throughout the day, we were captivated by the recent and ancient history of Israel and the region as provided by Abraham Silver—a frenetic, funny, and incredibly well-versed guide who shared so many anecdotes and stories that I want to come back and just travel around the country with him. Abraham shared the importance and history of water over the past four millennia and while we were enjoying a beautiful sunny day, he reminded us that this is the rainy season and the sun was less welcome than a bit of rain. He shared stories of the earliest movement of humanoids across the beaches of now modern Israel and the importance of the country to the Romans as a stronghold into the spice trade routes into the Persian regions. Caesarea was the throne of King Herod, and the remnants of Herod's bold manmade harbor still remain, as does the end of the Roman Aqueduct which brought water from the hills of eastern Israel to Caesarea. These tremendous engineering feats still represent the basis for water management which is practiced in many parts of the world today.



From the past at Caesarea, we traveled a short distance to the ultra-modern present and a tour of IDE's Hadera desalination facility. Hadera is the largest desal facility in the world, processing about 150 million gallons per day using reverse osmosis (RO) desalination at a very narrow footprint facility located next to a towering 80 MW coal-fired power plant. The facility was massive, modern, and elegantly efficient. It produces water for a price of \$0.57 per cubic meter, which is a fraction of a penny per gallon. Several 6 MW high pressure pumps feed the endless banks of RO membranes, and then the energy recovery devices at the end of the process recapture the vast majority of the energy, which enables it to be the most efficient desalination facility in the world—at least until the new plant at Sorek is commissioned next year.

Later in the day we traveled to <u>Old Jaffa</u> which is the "original" Tel Aviv and a city with fascinating history with great importance throughout the past 2,000-plus years. It was much cleaned up and improved since my last visit there over 20 years ago, and its narrow, stone streets have a variety of shops, bookstores, public art, and great restaurants. As we stood on the hill of Jaffa looking down onto the bustling activity of Tel Aviv, we learned of the brave experiment that founded modern Tel Aviv in 1909 and which helped shape the psyche and energy of Israel today. In that year, sixty families made their way to Jaffa and looked down from our same spot onto the endless rolling hills of sand that was then "Tel Aviv" and decreed that they would build a modern city in the form of New York. One hundred and three years later, Tel Aviv is truly one of the world's great cities with a strong economy, diverse culture, and a beautiful façade.

We finished the night with a lovely dinner in Jaffa at Cordelia, including an insightful and motivating talk by Amir Peleg, Founder and CEO of <u>TaKaDu</u>. TaKaDu is Amir's third startup in the data analytics space: the first was in telecom, the second in Internet marketing, and TaKaDu is borrowing from the first two in providing analytics which allow insights and better monitoring and management of water infrastructure. TaKaDu's SaaS model is a cleantech investor's dream with low burn rate, high gross margin, and massive global scalability. Amir and his team have done a great job of entrepreneuring in a traditionally slow-adopting industry by being lean, focusing on delivering value, and using current technology and hard-earned agility to drive the company forward crisply, earning global renown along the way.



So today took us across 4,000 years of history all centered around, and relying on, water. Water has always been a centerpiece of life in this part of the world, and the opportunities and challenges of managing water are no easier or less dire today than they were in Herod's time. We have better technology, but the cultural and economic challenges are remarkably similar. Perhaps it's true that technology is indeed outpacing human and societal development.

Later today, we network with the local Israeli entrepreneurs and visit some more world-scale plants...oh, and eat some more delicious Israeli food.

"Water Mission to Israel (Day 1): The Past and Present of the Israeli Water Story ", 17/12/2012, online at: http://www.xconomy.com/boston/2012/12/17/water-mission-to-israel-the-past-and-present-of-the-israeli-water-story/

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#### **\*** Water Mission to Israel (Day 2): Water Management Solutions at Scale

Monday in Israel started out quickly with the Massachusetts Water Delegation taking part in a global water market networking event with the CleanIsrael Meetup Group. <u>CleanIsrael</u> is a pan-Israel cleantech business network with over 1,000 members and is akin to the Clean Economy Network (now part of the <u>Advanced Energy Economy</u>).

After charging up with LOTS of caffeine, the combined group of well over a hundred folks shared ideas, exchanged business cards, and traded elevator pitches. I am starting to think that the Israel school system teaches Israeli kids how to do elevator pitches early in their educational process. On average, they are crisper and more focused on the core value proposition than the average U.S. pitch—this may be due to the fact that Israelis start thinking about how to commercialize outside of Israel very early in their lifecycle. That said, almost all the ideas and pitches tended to be very technical, which is not surprising as many of these ideas come out of the Israeli R&D infrastructure.

The MA delegation shared a set of insights about doing business in the U.S. water market by way of presentations by Pete Tunnicliffe, SVP at <u>CDM Smith</u>, Chris McIntire, President of <u>Xylem</u> <u>Analytics</u>, and Earl Jones of <u>Liberation Capital</u>. The key highlights were around the complexity of the regulatory framework, evidenced by over 45,000 water regulatory agencies in the U.S. Pete, Chris, and Earl collectively represent both a broad range of water experience in the U.S., but also deep expertise in international commercial operations, and the combined crowd had myriad questions around market segmentation, pricing, international operations, and how to sell into the U.S. and global markets.

One benefit of the delegation is that we have a nice representation from MA legislators in <u>State</u> <u>Senator Jamie Eldridge</u>, <u>State Representative Carolyn Dykema</u>, and MA Undersecretary of Energy & Environment Phil Griffiths. We also have state and federal regulators in MassDEP Commissioner Ken Kimmell, and Sally Gutierrez and Curt Spalding from the U.S. EPA. As this group represents a cross-section of the municipal water solution buyers, it has been great to have them on the trip. They each have fully engaged in every activity and discussion, which has allowed the MA delegation to interact with them as a whole each day, but also has enabled our Israeli hosts



and colleagues to directly approach them with ideas and solutions. (You can follow the delegation's activity on Twitter at #MWIM.)

After wrapping up the extended morning networking session, the group boarded three different buses. One for the academics, who headed north to Haifa and **Technion** (Israeli Institute of Technology), and the other two went to two different Mekerot water treatment facilities. <u>Mekerot</u> is the National Water Carrier of Israel and for 75 years has been tasked with managing the water resources of the country. This is a distinct difference from the fragmented system in the U.S. In Israel, the water belongs to the people, and thus Mekerot is the single, unified agency which produces, manages, and delivers this water on behalf of the Israeli people.

I went to Mekerot's **Shafdan Wastewater Treatment Facility** in Rishon LeTzion, 45 minutes south of Tel Aviv. It is a vast tract of land, less than 1 mile inland from the Mediterranean Sea, which treats the sewerage waste of over two million people from Tel Aviv and the other central communities of Israel. There were the expected large pools and flowing tracks of wastewater, but most of the truly intriguing activity was underground. The Shafdan Facility uses natural hydrology and the immense banks of sand and natural flow of the local aquifers to clean 130M cubic meters of biological waste from the sewer system every year. They have had issues with some of the secondary sludge making its way back to the Med so they are working with CDM Smith to install massive anaerobic digesters (see image below), which will turn this waste into 11 MW of energy, more than enough to run the entire facility.

The most impressive thing about this facility is that the clean water that is produced in this multistage process is then sent over fifty miles south to the desert region of Negev representing nearly 55 percent of the landmass of Israel. This water has enabled the "greening of the Negev," creating a fertile crescent of agriculture which is not only feeding Israel but also providing exports to other countries. This water is also available for Gaza, and this has significant geopolitical potential and implications. Israel reuses over 80 percent of its water, far exceeding the second best country in the world, Spain, which reuses only 18 percent.

What do you think this U.S. number is? I will share this in tomorrow's entry but it's not a number to be proud of...



The final group went to the central filtration plant in **Eshkol** (pictured below). This facility is the fourth largest water treatment plant in the world and the first of its kind in Israel. Eshkol was constructed in June 2007 and filters water pumped from Lake Kinneret (Sea of Galilee) through the state-of-the-art facility. Eshkol supplies over one-third of Israel's population with 1.7 million cubic meters of filtered water 24 hours a day. The water is pumped from Kinneret, Israel's primary source of water, and filtered within an average time of 18 hours, as compared to the 90 minutes at the Hadera facility, which was treating water from only a few hundred meters away in the Med.

The day finished up with an amazing dinner at Vino Socca in Herzliya Pituach, which is the neighborhood near our hotel, near the beach in Tel Aviv. Tom Burton and his Mintz Levin team did a great job of hosting the group and we had a fabulous set of speakers including Dr. Daniel Zajfman, President of the <u>Weizmann Institute of Science</u>. The Weizmann reportedly has the highest royalty revenue of any Tech Transfer Office in the world. President Zajfman attributed this not to hiring the best scientists (although they do), but primarily because they seek out and hire for "curiosity and passion."

The Israeli Minister of Energy and Water, Dr. Uzi Landau, wrapped up the evening by sharing a captivating set of perspectives, including how he and Prime Minister Benjamin Netanyahu met on the steps of Building 77 at MIT. Minister Landau joked that he was responsible for two resources, energy and water, that Israel has neither of. However, over the past 25 years, through a powerful vision, commitment, and innovation, Israel is now water independent. And despite 7 tough years of drought, Israel is very close to replenishing all of the natural fresh water resources it has depleted over the past many years by returning over 2 billion cubic meters to the aquifers and rivers of Israel. And with the recent find of natural gas off the coast of Israel, energy independence may not be too far away as well.

Minister Landau (left) finished his comments by sharing the hopeful vision of Israel supplying water and energy to its neighbors with an eye towards peace among the various religions and nations in the region. On that note, it has been remarkably calm and normal in Israel considering the fighting that was so intense only a month ago.



#### WATER RESEARCH PROGRAMME -Weekly Bulletin-

Overall, a hugely interesting and informative day that helped bring into focus how Israel has crafted an impressive vision and executed with persistence and excellence to bring their water management solutions to scale and enable water independence. Tomorrow we host the <u>W.E.T. Revolution</u> before heading "up" to Jerusalem.

"Water Mission to Israel (Day 2): Water Management Solutions at Scale", 18/12/2012, online at: <u>http://www.xconomy.com/boston/2012/12/18/water-mission-to-israel-day-2-water-management-solutions-at-scale/</u>

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#### **\*** Water Mission to Israel (Day 3): Startup Day in Startup Nation

Tuesday, December 18th, was the midpoint of the Mission agenda and the centerpiece event of the trip. The Massachusetts Delegation hosted the <u>W.E.T. Revolution</u> at Tel Aviv University in the lovely and historic Green House, which was apparently originally built as part of a Palestinian Village, and at various times since has been part of the British complex in Tel Aviv, served as a HQ for the Israel Defense Forces during the 1948 Arab-Israeli War, and is now the Gordon Student Center at the University. Such is the complex and swirling history of so much of Israel.

The W.E.T. (Water Export Technology) Revolution was conceived to highlight the most promising Israeli water startups and build a bridge for them to the U.S. via Massachusetts. Applications were received from thirty-two companies across a broad range of technologies and stage. From this pool, seven semi-finalists were selected and recognized at the event. But the real action surrounded the six companies selected as finalists that pitched the two hundred people gathered in the Green House, including the MA Delegation, Israeli entrepreneurs and investors, and a wide variety of water industry executives and government officials.

The six finalists had four minutes each to present their business and to differentiate themselves to the six judges who then had three minutes for questions. The judges were a collection of both MA Water Trade Delegates and very senior Israeli water industry players including Dr. Avner Adin (Professor of Environmental Sciences at both Hebrew University and The National University of Singapore), Henri Charrabe' (President & CEO of RWL Water Group, a global water systems integrator), and Shimon Tal (Former Water Commissioner of Israel and Chairman of WATEC 2013).

**WATEC** (Water Technology And Environmental Control) is one of the world's largest gatherings of global water players and has emerged, along with the **Singapore International Water Week**, as one of the main global gatherings of the water industry. WATEC is Oct 22-24, 2013, and SIWW is June 1-5, 2014.

The fast-moving presentations were well conceived and delivered; only one went (slightly) longer than the allotted time. The Israelis, for all their independent mindedness, were surprisingly compliant to the rules of engagement for the contest.



The finalists were Atlantium Technologies (UV disinfection of water), Blue I Technologies (realtime water quality instrumentation), emefcy (pronounced MFC, lost cost, waste-water filtration), CuraPipe (leak curing for underground pipes), Peak Dynamics (water delivery management system) and TACount (real-time microbiology measurement).

As the judges were deliberating, members of the MA Delegation presented a cross section of initiatives, organizations, and opportunities designed to foster water and clean technology innovation across Massachusetts and New England, and which the Israeli startup community could leverage to use MA as a landing point for U.S. operations.

Hundreds of Israeli-based companies have done just this over the past few decades and now represent an estimated \$2B of direct annual revenue, and over \$5B of indirect income into MA-based operations. There is significant opportunity to expand this in the cleantech and water sector, an aspiration which drove the initiative for the Mission itself and which was validated in our travels and interactions across Israel.

The crowd also heard from Avi Hasson, Chief Scientist of Israel, and Dr. Orna Berry, General Manager for EMC's Israeli Center of Excellence, who was herself formerly the Chief Scientist of Israel. The main role of the <u>Office of the Chief Scientist</u>(OCS), which is part of the Ministry of Industry, Labor & Trade, is to assist in the development of technology in Israel as a means of fostering economic growth and encouraging technological innovation and entrepreneurship. The OCS interfaces across the Israeli R&D infrastructure, especially with the military and also with various industries, including venture capital, to ensure Israel is and remains a global center for high-tech entrepreneurship.

If you have not read <u>Start-Up Nation</u>, I definitely commend it to you as it does an excellent job of examining the Israeli high-tech complex and deriving lessons that are applicable in other locations and contexts.

I was struck listening to both Avi and Orna that the U.S. does not truly have an equivalent role. Sure, DOE, Commerce, SBA, and even the White House have programs, but none as integrated into the national innovation enterprise. I took a major personal action item to explore this further when



I return to Boston as, given the importance of innovation in the future of the U.S., we ought to have an Innovation Czar (pardon the ideological oxymoron).

By the way, the winner was TACount, whose CEO, Charles Gast was born and raised in New York City, but has been in Israel for much of his professional career. TACount was awarded a broad range of prizes including airfare, office space, legal support, and customized support to help facilitate their efforts to explore setting up shop in Boston.

Pictured above: W.E.T. Competition Winner TACount (CEO Charles Gast, 3rd from left) with (from left) John Harthorne, CEO of MassChallenge; Alicia Barton McDevitt, CEO of MA Clean Energy Center; Nadav Efraty, CEO of Desalitech; and Hadas Bar-Or, MA's Trade Representative in Israel. Yours truly was the host & emcee for the W.E.T. Revolution.

Once the event wrapped up, we boarded the bus (again) and began the hour-long journey southeast up the Judean Hills into Jerusalem. I had only been to Jerusalem once before, in 1991, for a fast and furious three-hour tour of the Old City. I had not appreciated how large the city's footprint had grown over the millennium, but, as the second largest city in Israel and its capital, the dense blend of architecture literally spanning most of human history was astonishing.

The delegation went to dinner in the <u>American Colony Hotel</u>, which was charmingly decorated for the Christmas celebrations and has a fascinating history dating back to the late 1800s and has since been a centerpiece of "modern" Western presence in Jerusalem. Over dinner we had the chance to hear from the Dr. Alon Tal, the impressive founder of <u>The Arava Institute of Environmental</u> <u>Studies</u>, which is dedicated to finding sustainable solutions that know no borders or religion. Alon is a Green Party candidate for <u>Knesset</u>, the Israeli Parliament.

Alon's comments covered a broad set of topics centered on how sustainable technology solutions can bring peace and prosperity to the entire region. But he was most impassioned when discussing the surprisingly low penetration rate of renewables in Israel. Given the high levels of annual sun, dedication to sustainability, and the impressive record of innovation in every other sector Israel has set itself to tackle, it was notable that far less than 1 percent of the nation's electricity comes from solar. Given that nuclear power is problematic for geopolitical reasons, solar would be the likely



solution to reducing carbon emissions. However, given the nascent exploration of the massive offshore natural gas fields, it appears unlikely that renewables will gain a foothold in Israel anytime soon.

After dinner, our guide Abraham Silver took us for an evening visit to the **Western Wall** (see photo below) in the Old City of Jerusalem for a walking tour of the**underground tunnels** along the old Wall. These tunnels, opened only in the last decade for public touring, brought our group from the public area providing access to the sacred Western Wall to a set of tunnels meandering beneath the Old City and literally along thousands of years of history. The walk uncovered the scars of dozens of battles across these many years and highlighted the amazing engineering feats that built the original city. King Herod had serious vision and, apparently, a talented corps of engineers. Built in 19 BCE, it took ten years and ten thousand workers to complete the construction of the Old City, including leveling several hilltops and moving endless 200-ton blocks of stone to build the city without cement, cranes, or CAD-CAM. It was truly impressive, and fascinating.

Wednesday is the final day for the full delegation. We will meet with the Israel governmental leaders, plan for the return trip home, and decide how best to continue the momentum generated during this visit; and extend the tour of Jerusalem by picking up with the story of Jesus's role in shaping the history of the city.

"Water Mission to Israel (Day 3): Startup Day in Startup Nation", 21/12/2012, online at: http://www.xconomy.com/boston/2012/12/21/water-mission-to-israel-day-3-startup-day-in-startup-nation/

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#### **\*** Water Mission to Israel (Day 4): Bringing It All Back Home

Wednesday, December 19th, marked the last day the full delegation was together in Israel. Several members headed for the airport to catch late-night flights after the final dinner, while a number of smaller groups are remaining behind to pursue additional meetings and touring activities over the coming days.

The morning sessions were dedicated to open discussions with members of the Israeli government and Parliament, focused on water and sustainability. These sessions reinforced the experiences and interactions of the past few days and the vital role that the Israel Central Water Authority has in driving policy for the production, delivery and consumption/pricing of water resources. It seems and sounds so simple, but actually having a coherent resource policy has been instrumental in allowing Israel to accomplish water independence.

It also reinforces and highlights the need we have in the U.S. for much crisper and consistent resource policy to help drive innovation and improvements in our infrastructure and resource portfolios. We often hear the cry for an "energy policy," but what we really need is a "resource policy" that accounts for the interdependencies of energy, water, agriculture, and other critical resources.

Ed Freedman (Oasys Water's CFO) and I also had the chance to have breakfast with one of Oasys's scientific advisory board members, Dr. Jack Gilron of **<u>Ben-Gurion University</u>**. Ben-Gurion is, of course, named after Israel's "Founding Father" and first Prime Minister, <u>**David Ben-Gurion**</u> and, with twenty-thousand students, is the largest University in Israel. It has exceptional engineering and science programs and research, and has a commitment to a "Green Campus" approach across the three distinct campus locations.

Jack Gilron is a world-renowned water technology and membrane expert, and while most of the conversation centered around Oasys-specific topics, as we discussed various ways to do joint research, the simplicity and cost effectiveness of the available mechanisms reminded me how the R&D infrastructure of the U.S. has become increasingly costly and complex to access. For example, the overhead rates charged by Israeli universities is significantly less than those in the U.S., and there



is far more willingness to explicitly tie intellectual property into these agreements. There is also more money available to support and leverage industry-to-academic R&D work than in the U.S. As with many things, this all sounds good, but as we follow up on these potential opportunities, we will find out whether they were as efficient and impactful as they seem—but directionally there is clearly room for improvement in the U.S.

The MA delegation then gathered for lunch at the <u>Menachem Begin Heritage Center</u>, the equivalent of a Presidential Library (see photo below). It was a modern facility in the hills of Jerusalem and was bustling with families, students, and other groups.

The goal of this final working session was to debrief the myriad activities and interactions of the past few days in order to distill the main lessons learned and to craft an action plan for our return to Massachusetts. Through small working group sessions, several key insights were crystallized and follow-up initiatives defined.

--Creating Pilot Facilities: The most consistent observation and desire was to facilitate mechanisms whereby pilot testing opportunities could be created for new innovations at existing facilities. This initiative will require the facility owners & operators, regulatory agencies, funding sources, and the innovators to align around the process and risk & rewards of doing this. The hopeful part of this was that we had representation from each of these groups on the trip, and a detailed set of concepts were defined and set in motion.

—Structuring MA Water Cluster: Another area of focus was what form the MA Water Industry initiative ought to take as it evolves. The industry and its players are very diverse, so defining an organizational structure and mandate will be challenging. The <u>Massachusetts Life Science</u> <u>Center</u> is one model but has the support of the \$1B industry grant. The <u>New England Clean Energy</u> <u>Council</u> and<u>MA Clean Energy Center</u> both have initiatives to understand their role in the water industry. In fact, MassCEC recently <u>posted a new position</u> for a business development executive to focus on a set of initiatives to help make MA a leading water cluster.

—**Facilitating Collaboration**: The many researchers and academics on the trip had a chance to not only meet their Israeli colleagues, but one another. All the time on the bus apparently has led to



a broad set of potential collaborations as we had folks focused on modeling, system development, surface and ocean water quality, membranes, public policy, and a variety of other areas. Spawning more interactions across MA- and U.S.-based researchers can only be a good thing for the water industry. As is often the case, researchers get siloed, focusing only on their narrow field. Given the holistic nature of water challenges and solutions, facilitating more cross-discipline dialogues and projects is mission critical.

—**Expanding Water Missions**: The trip to Israel was a natural first step for the nascent MA water cluster. MA and Israel have a strong relationship, and adding water to the list of other industries that have built bridges across the Atlantic Ocean and Mediterranean Sea makes good sense. However, if MA is truly to build a world-class center of excellence in water, we need to extend the network to include other key locations. For example, Singapore, China, Australia, and Latin America are all areas that represent high potential export markets for MA-based water innovation. Overall, MA-based innovators, in the water sector or not, need to continue to push forward the mantra of Local Innovation, Global Impact.

After we finished up the debrief and planning session, the majority of the group headed off for an afternoon of touring in the Old City, this time focused on the stories surrounding the life and death of Jesus. We toured the various sites that comprise the "Stations of the Cross" so central to Roman Catholicism. After seeing these scenes on stained glass in churches around the world, it was remarkable to walk the tight, ancient, stone line streets including <u>Via Dolorosa</u> and realize that these events all happened in a tiny area essentially the size of Harvard Square. Whatever your interpretation of the story or your beliefs, it was a powerful experience to be in a place whose history has so strongly shaped the modern world.

We also entered Austria for about a half-hour. At different points in history, in the early 1800s for Austria, various countries have established domiciles in the Old City. So when we entered the **<u>Austrian Hospice</u>** (of the Holy Family), we legally entered Austria. It was one of a number of these European-rooted hospices but the rooftop view from the Austrian Hospice offered an amazing, panoramic view of the entire Old City (see photo below) which gave a visual sampling of the entire history of the city.



The day wrapped up with dinner at the elegant <u>**Yvel Pearl Factory**</u> just outside Jerusalem. The Levy Family has been one of the world's leading producers of pearls, and they established the modern facility in Jerusalem in 1986. Pearls are now "farmed" sustainably, increasing the yield of pearls while reducing the impact on oysters and the ecosystems they thrive in. At the factory, the Levys train dozens of Israeli immigrants, mainly from Ethiopia, to become artisan jewelry designers. The jewelry was exquisite, but the story of the Levys' commitment to helping the next generation of immigrants gain valuable skills and to assimilate into society was compelling.

So the fourth and final day of the Mission was yet another mix of history, culture, technology, and insights into how our society has evolved, but also how we can shape the future to be even more productive and impactful.

Thursday I head back on an early flight through Newark, then to Boston. I have thoroughly enjoyed the Mission, having learned immensely from our hosts and my fellow delegates. While I am a bit sad to leave Israel with all its sights and sounds, I will be glad to get back to MA, where we can get to work on the various opportunities and initiatives.

Thanks to Governor Patrick and his Executive Team for prompting and supporting the Mission and to <u>CJP Boston</u> for their incredible planning and execution skills. And a special thanks to <u>David</u> <u>Goodtree</u> (@dgoodtree) for his tireless leadership in making this trip a reality.

Back to Boston, and back to work on making water innovation a reality...

"Water Mission to Israel (Day 4): Bringing It All Back Home", 22/12/2012, online at: http://www.xconomy.com/boston/2012/12/22/water-mission-to-israel-day-4-bringing-it-all-back-home/

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#### ✤ Sea of Galilee water level very encouraging

Israeli officials now believe that the region will receive more rain than expected this winter, bringing the Sea of Galilee back up to a level it has not been at in over 10 years.

Speaking to Israel's *Ma'ariv* newspaper, Israel Water Authority official Dr. Amir Givati noted that due to abundant rainfall already this winter, the Sea of Galilee already began to rise in late October, more than a month before is typically starts to rise in the annual rain cycle.

"Our estimate at the beginning of the winter was that we were facing an average winter," said Givati. "Today we believe that it will be more than that, at least in the north of the country.

Givati explained that even if precipitation levels were only "average" this winter, the Sea of Galilee would still rise to 210.8 meters below sea level, which is just two meters below its "upper red line." That is a major increase following seven years of drought, when the Sea of Galilee raced past its "lower red line" and repeatedly flirted with its "black line."

The rise in the lake's water level comes primarily from the northern part of the Jordan River and the streams that run down from the Golan Heights, all of which started flowing much earlier than usual.

"To see the Jordan River flowing at this time of year - that's a phenomenon that takes place once every 20 years," Givati said. "Streams like Ayun and Sa'ar usually begin to run only in the spring, but this year we're already seeing them gushing."

"Sea of Galilee water level very encouraging", 20/12/2012, online at: http://www.israeltoday.co.il/NewsItem/tabid/178/nid/23579/Default.aspx

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#### \* Mass., Israel cooperate to build water innovation

An Israeli firm specializing in rapid microbiological water testing is set to showcase its system in the New England hi-tech hub.

As Massachusetts eagerly seeks Israeli partners in water innovation, a Herzliya-based firm specializing in rapid microbiological water testing will get the chance to showcase its systems in the New England hi-tech hub.

Led by CEO Charles Gast, the TACount company was the winner among six finalists in the W.E.T. (Water Export Technology) Revolution Competition on Tuesday in Tel Aviv, organized by the Massachusetts Water Innovation Mission to Israel – a trade delegation of 48 industry executives.

The competition was a business opportunity for Israeli water technology firms to find a gateway to the North American market, as well as a networking event for innovators and investors on both sides

Massachusetts's interest in Israel really began in 2010, when a state survey showed that in 2009 nearly 100 Israeli companies were located in the state, contributing 6,000 jobs directly and 21,000 jobs indirectly, as well as generating \$2.4 billion per year, explained Hadas Bar-Or, trade representative to Israel for the Commonwealth of Massachusetts.

Following the survey, Massachusetts Gov. Deval Patrick made a trip to Israel in 2011, and at the end of the year appointed Bar-Or to be the trade representative there.

"This is the only trade office Massachusetts has outside of Massachusetts," Bar-Or said.

"It goes to show how highly important the relationship is with Israel."

For Jim Matheson, a partner at Flagship Ventures and president and CEO of Oasys Water in Massachusetts, Israeli and Massachusetts entrepreneurs are ideal cleantech partners. In addition to having many Israelis studying and working in the state, particularly in the Boston area, Matheson said that there is a "like-mindedness between New Englanders and Israelis," a straightforward way of thinking.

"When the governor came here in March 2011 he got exposed to the world class water cluster based in Israel," Matheson said. "He came back to Massachusetts and started to inquire what water resources are available there."

For the past 18 months, representatives from the state's water industry have been working on developing a similar type of cluster of resources.



"As a natural outcropping activity in formalizing activity and strengthening relationship it was a natural activity for us to come to Israel," Matheson added.

Alicia Barton McDevitt, executive director and CEO of the Massachusetts Clean Energy Center (MassCEC), agreed that Israel is a "natural partner" for the US state.

"We have similar sized economies, have similar strengths, and that really is a focus on innovation and entrepreneurship, with life science, hi-tech, Internet, cleantech, water technology," Barton McDevitt said. "We have natural linkages between our strengths each focusing on advanced research and innovation."

MassCEC runs a joint program to fund Massachusetts and Israeli cleantech projects with Israel Industry, Labor and Trade Ministry chief scientist Avi Hasson and MATIMOP, the executive agency of Hasson's office that generates international cooperation on and implementation of research and development programs.

The program, called Massachusetts- Israel Innovation Partnership (MIIP), recently announced the winners of its first round of funding, and will soon open a second round with \$250,000 of funding from both sides.

As one of the largest challenges in the world is water scarcity, Barton McDevitt said she hoped that the two place s could help pinpoint world-saving technologies together.

Meanwhile, Massachusetts is perfectly situated on the East Coast to be a "comfortable gateway to the US" for Israeli entrepreneurs, she added.

John Harthorne, co-founder and CEO of MassChallenge, the largest start-up accelerator in the world, was excited to be part of the mission in order to meet with potential Israeli candidates for participation in the accelerator. With an "overall mission to catalyze the startup renaissance," MassChallenge takes 120 start-ups under its wing every year.

"There's a very welcoming community for Israeli innovators in the Boston area," Harthorne said. "We are eager to support more Israelis and strengthen that existing bond."

To that effect, the accelerator will likely be launching an initiative called MassChallenge Israel toward the end of January, the first accelerator program designed for start-ups from a specific country, he explained.

Not only do Israelis tend to be well-educated and focused, but "because Israel is small all Israeli innovators are looking globally from day one," Harthorne said.



From the Israeli side, a firm called Desalitech, which focuses on reverse osmosis processes for effluent treatment, used the event as an opportunity to announce that it would be launching its commercial and operational headquarters in Massachusetts.

"The State of Israel was welcomed so warmly there," Desalitech CEO Nadav Efraty said.

As far as the competition goes, Gast – the CEO of TACount – stressed that "Massachusetts is a great hub for biotech," and that he hopes to form strategic alliances there. As part of his win, he will get a week-long networking trip to the state to meet with potential investors and customers, and 20 hours worth of pro bono legal advice from Massachusetts and Israeli law firms.

"All of the types of companies we would be looking for have a presence there," Gast said. "It's a great opportunity to evaluate possibilities for R&D, sales and strategic alliances."

"Mass., Israel cooperate to build water innovation", 18/12/2012, online at: <u>http://www.jpost.com/Sci-Tech/Article.aspx?id=296502</u>

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#### ✤ Israel experiencing wettest winter in years

In past three days, 100 millimeters of rain recorded in the north; Mt. Hermon hit by 30-40 centimeters of snow; Water Authority optimistic on Sea of Galilee water levels

Three solid days of rainfall across the country has water authority officials calling the the winter of 2012-13 the wettest since 2004.

In the north of the country, rivers — often just trickling even at this time of the year — can be seen gushing with force as they collect the torrents from the surrounding tributaries, expanding in width tenfold.

Many of the measuring stations in the north reported more than 100 millimeters of precipitation Friday since the beginning of the storm. The largest amount of rainfall, 135 millimeters, was recorded in Kibbutz Eylon in the Western Galilee. The kibbutz experienced the most rainfall in the country and also broke its own record for precipitation in a 24-hour period.

Mount Hermon, in Israel's far north border with Syria, was hit with 30-40 centimeters of snowfall, a rare occurrence so early in the year.

The level of the Sea of Galilee, one of the country's primary sources of water for home and agricultural use, is headed for an almost-20-year high at this time of year, with water levels rising nearly 10 centimeters (4 inches) in the last 24 hours alone. Since the first rainfall of the year, on October 29, the lake's level has risen 26 centimeters more, settling, for now, at 212.18 meters below sea level.

Tel Aviv experienced a modest 10 millimeters of rainfall in the past 48 hours, but it was enough to get the current flowing in the Ayalon River, which flows alongside the city's major north-south highway.

Jerusalem experienced 35 millimeters of rainfall in the past three days.



The bountiful rains didn't come without a cost. Fallen trees and broken electricity cables caused blackouts in several locations around the country. Wet roads and poor visibility were responsible for two fatal car accidents.

Heavy rain was expected to continue throughout the weekend, before subsiding slightly on Sunday evening and Monday.

"This is clearly a much better start [to the winter] than we were expecting," said Dr. Amir Givati, the head of the Surface Water and Hydrometeorology Department at the Israel Water Authority. "We expected it to be good, but not this good."

Givati said that the increased precipitation - so far, up to 40 or 50 percent more rain in the North than is usual for this time of year - was evident in an increased volume of water flowing through streams and brooks, the Hebrew daily Maariv reported.

"To see the Jordan River flowing at this time of year – that's a phenomenon that takes place once every 20 years," he said. "Streams like Ayun and Sa'ar usually begin to run only in the spring, but this year we're already seeing them gushing. During the last rainy Saturday there were flows of a magnitude [for December] that haven't been recorded since 1994, and that's before Saturday, which is also expected to be rainy."

"Our estimate at the beginning of the winter," Givati said, "was that we were facing an average winter. Today we believe that it will be average and even more – at least in the north of the country.... According to our calculations, if the [precipitation this] winter will turn out be average, the level [of the Sea of Galilee] at the end of the season will be 210.8 meters below sea level – only two meters below the lake's 'upper red line.' Of course, if rainfall exceeds the multi-year average, the level will be even higher."

The "upper red line," 208.9 meters below sea level, is the level at which the Degania Dam is opened to allow an increased flow into the Jordan and prevent the lake from flooding the city of Tiberias and other towns along its coast.



In the past two decades, Israel has experienced several successions of arid winters, exacerbating existing concerns that the country was overdrawing from the Sea of Galilee and from its aquifers and increasing the risk of rendering its fresh-water reserves undrinkable.

Several desalination plants have been established along the coastline in recent years, with others in the pipeline, but despite being an international leader in this area, Israel still relies on rain for much of its water needs.

"Israel experiencing wettest winter in years", 21/12/2012, online at: <u>http://www.timesofisrael.com/israel-experiences-wettest-winter-in-a-years/</u>

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### West Bank: a concert to draw attention to the region's threatened environmental heritage

Friends of the Earth Middle East (FoEME) organized a concert this week in the Palestinian village of Battir to raise awareness about the route of the Separation Barrier due to be built in this area of tremendous ecological and cultural significance to all the people of the region. The event was supported by the EU's Partnership for Peace programme. Battir, a Palestinian village of the West Bank, is an exceptional example of terraced agricultural fields dating back 4,000 years, which is trying to obtain recognition as one of UNESCO's World Heritage Site.

FoEME brought for the concert world renowned Israeli singer Noa (Ahinoam Nini) to perform and add her name to protect the site. Palestinian singers and dancers were also present. More than 300 Israelis and Palestinians, mostly local residents, attended the event. FoEME is an NGO that brings together Jordanian, Palestinian and Israeli environmentalists who seek to protect their common environmental heritage. The concert was organized in the context of the Good Water Neighbours project, funded under the EU's Partnership for Peace Programme, whose aim is to raise awareness of the shared water problems of Palestinians, Jordanians and Israelis.

For photos of the event,

see: http://www.flickr.com/photos/45396204@N04/sets/72157632222098806/

For a video from the event, see: <u>http://www.youtube.com/watch?v=BekAsAeegsQ</u>

"West Bank: a concert to draw attention to the region's threatened environmental heritage", 21/12/2012, online at: http://mideastenvironment.apps01.yorku.ca/?p=6595

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#### \* Israeli delegation brings urban water expertise to India

Mission of top Israeli experts travels to Raipur, New Delhi to further advance two nations' collaboration on urban water management

"There is a an almost uncanny fit between India's needs in the urban water arena, and what Israeli companies are able to offer," Abraham Tenne, VP Desalination at Israel's Water Authority said recently, following a visit to India.

The visit was held as part of an agreement signed in February between Jerusalem and New Delhi, aimed at fostering cooperation, with a focus on urban <u>water management</u>.

The Israeli delegation included, in addition to Tenne, Oded Distel, head of<u>Israel NewTech</u>, Zohar Yinon of the Jerusalem Water Authority and Elisha Arad of the Standards Institute of Israel.

The mission toured the Raipur water system, as guests of Taran Prakash Sinha, commissioner of the Raipur Municipal Corporation.

Raipur is the capital city of Chhattisgarh, in central India, which has a population of over one million. The Indian officials taking part in the Raipur visit were very interested in learning from<u>Israel</u>'s expertise in the field.

The delegation followed its visit to Raipur with one to New Delhi, where they attended a seminar sponsored by the Indian Ministry of Urban Planning.

"India presents huge challenges in urban water planning. First and foremost, a change in concept is needed, one in which people begin to perceive water as the precious resource that it is." Distel said.

"Once this change in perception occurs, then changes can be achieved in urban water supply, management, measurement, pricing and collection. This is a very dramatic change, but the community of Indian urban water professionals appears poised to make it."



"India today is roughly in the situation in which Israel was 10 or so years ago, with 12 different government ministries responsible for urban water," Tenne added.

"This created a lot of confusion and inefficiency, which was solved when water treatment was placed under the leadership of the Water Authority. The Indian water community looks to Israel as a sort of guru, they know the Israeli water industry very well and hold it in very high regard."

Yoni Ben Zaken, Israel's Economic Attaché to India, concluded, "Raipur is a starting point, but there are 600 more cities in India with a similar urban water situation and needs, so the market potential is very significant."

"Israeli delegation brings urban water expertise to India", 20/12/2012, online at: <u>http://www.ynetnews.com/articles/0,7340,L-4319533,00.html</u>

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#### Stenzler tells 'Post' about 'green diplomacy'

KKL-JNF World Chairman Efi Stenzler offers proof of his right to describe himself as a diplomat.

Florists around the world suggest that the best way to express affection or appreciation is with flowers. Keren Kayemeth Le'Israel- Jewish National Fund would rather say it with trees or shrubs, which would explain why so many of the participants in The Jerusalem Post's inaugural Diplomatic Conference on Wednesday went home carrying souvenir potted plants and shrubs that will flourish into trees and large bushes.

KKL-JNF was a sponsor of the conference – which took place at the Daniel Hotel in Herzliya Pituah – as were Israel Discount Bank, Bank Leumi USA, Assuta, and The Ambassadors' Club of Israel. KKL-JNF World Chairman Efi Stenzler offered proof of his right to describe himself as a diplomat, since his organization – aside from its transformation of arid areas of the country into lush forests – practices green diplomacy.

We have forged partnerships with top environmental agencies from around the world such as the US Forest Service, as well as professional agencies in developing nations," he said.

"We take every opportunity to share our knowledge with others and to learn from our international partnerships."

An example of the knowledge the organization has been sharing is its expertise in planting forests in semi-arid areas. This knowledge is particularly important because the new forests will absorb greenhouse gases and curb the rate of global warming, said Stenzler.

KKL-JNF is responsible for implementing the most advanced methods of desert agriculture as well as rehabilitating desertified areas, he continued, explaining that desertification harms agronomic and economic production abilities of agricultural fields, grasslands and forests.

The organization has also developed expertise in the country's water infrastructure and has built 241 reservoirs, which supply two-thirds of the water used in Israeli agriculture.



Canadian Ambassador Paul Hunt was gratified to hear that KKL-JNF had established a partnership with the Canadian province of Manitoba, which has more than 100,000 lakes and is interested in maintaining them in the most effective way possible.

When water management experts from Manitoba came to Israel and saw the way Israel managed Lake Kinneret, which provides a quarter of the nation's water, Manitoba Minister of Water Stewardship Christine Melnick initiated a partnership that embraces the sharing of knowledge and research.

Israel also has valuable experience in developing irrigation solutions, new species of plants and produce and new production methods. Stenzler cited the Arava as a prime example.

KKL-JNF also constructs reservoirs, infrastructure for agriculture, tourism sites and municipal parks, and plans to attract 100,000 new residents to the Negev. In addition, it works in Beduin towns and villages, including the Wadi Atir project, which JNF USA helped found in the village of Hura.

Stenzler was particularly proud that his organization had joined forces with a UNESCO initiative promoting the cultivation of olive trees in Mediterranean countries. The idea behind the project is to preserve the cultural landscapes of olive groves and thereby promote ecological tourism. In the context of this project, KKL-JNF has created an olive path throughout the country, at the initiative of Ambassadors' Club of Israel founder and president Yitzhak Eldan.

Now that cycling has become so trendy in the country, KKL-JNF is in the process of establishing the infrastructure for thousands of kilometers of bicycle tracks and scenic road in forests, Stenzler added, indicating that his 111-year-old organization was ready to meet any new challenge.

"Stenzler tells 'Post' about 'green diplomacy" ,Jerusalem Post, 16/12/2012, online at: http://mideastenvironment.apps01.yorku.ca/?p=6561

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WWW.ORSAM.ORG.TR

Mithat Paşa Caddesi 46/4 Kızılay-Ankara TURKEY Tel: +90(312)4302609 Fax: +90(312)4303948 orsam@orsam.org.tr



#### \* The coming food crisis is here

The proportion of food that goes to waste in developed countries comes to more than 30 percent – that is, nearly a third of the food produced ends up in the trash.

No one can say with certainty what will happen in the future, but one thing is clear: Food prices will rise globally. Already today there is great fluctuation in the prices of agricultural produce, and local crises, such as the draught last summer in the United States, are destabilizing seasonal prices even further. Researchers believe that the frequency and intensity of these fluctuations will spur an increase in the prices of agricultural and processed foods, and that there is a danger that in the future, they will be beyond the reach of certain populations across the world.

The shortage of water for irrigation, rise in energy prices, climate change and declining soil fertility will all necessitate changes in the worldwide agricultural cycle and production map. The share held by today's producer regions in global agriculture will plummet because of low productivity and a lack of economic feasibility. By contrast, in other regions on the planet it may still be possible to produce food, but the costs of transporting the fresh produce (between regions or continents ) will spark higher prices.

From the economic standpoint, it may be "only a question of price." But such a perspective is destructive, and already today we can find regions whose inhabitants cannot afford fresh fruit and vegetables around the year because of their high price. This is a crisis that is growing worse in Israel, as well as around the world.

Israelis should prepare for the crisis now: We live in a small country with limited means of production, and therefore our impact on global food production is negligible. However, the need to provide the country's citizens with food requires continued technological and biological development, and planning now for the next 20 to 30 years. That is not a long time in terms of agricultural research and development.

Long-term planning of this sort must take into account export and import data, proper usage of precious natural resources, and consideration of alternative crops – based not only on our capacity to produce them, but also on their nutritional value and contribution to human health. It is vital to get



started as early as possible on this, and the planning should be backed by the state and implemented on a national level.

To prepare for the coming food crisis, agricultural research should be placed at the center of the processes of finding solutions. We must contemplate how to maximize crops' production in a sustainable way, that is, to have minimal damage to natural resources in worsening climate conditions. To these ends we need to invest in and accelerate groundbreaking thinking about automated processes that will lead to greater precision in farming and savings on input, as well as to improved biological processes that will in turn impact crop yield and quality.

The time has come to reconsider the use of genetic engineering, as well. The traditional tools for improving crop varieties against many agronomic threats have been exhausted and are in any case time-consuming. We believe genetic engineering will allow us to make a great leap forward in a short span of time, and that will enable us to feed nine billion people in 2050.

But research alone cannot save the country from the anticipated food crisis. We must enlist the governmental apparatus and the business sector in this process, and bring about changes in local food-consumption patterns. The proportion of food that goes to waste in developed countries comes to more than 30 percent – that is, nearly a third of the food produced ends up in the trash. Increasing awareness about prudent and correct consumption is no less a national mission than finding solutions to increasing agricultural production.

The children born in 2000, who will be celebrating their bar mitzvahs shortly, do not yet know of the heavy burden they must shoulder. "Nutritional security" is still a vague term. They cannot imagine life in a world that is suffering from a lack of high-quality water sources, that is three to four degrees Celsius hotter than the average temperature today, in which agricultural areas – and the manpower needed to cultivate them – are shrinking. We, as adults and parents, have the responsibility to bring the bad news to their attention.

Thus, beyond the solutions that future generations will have to come up with, there remains the question of dealing with it right now. Governmental help – and perhaps also the assistance of non-



governmental organizations – will be needed for allocation of the resources necessary to help solve the local and global food crisis

Prof. Yoram Kapulnik is head of the Agricultural Research Organization at the Volcani Center, and chairman of the Agriculture Ministry's food-crisis planning committee.

"The coming food crisis is here", Haaretz, 16/12/2012, online at: http://mideastenvironment.apps01.yorku.ca/?p=6569

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#### ✤ Doha to host Middle East water summit next year

DOHA: WaterWorld Middle East 2013 conference and exhibition will bring the global water sector together at the Qatar National Convention Centre from February 4 to 6 next year.

Organised by PennWell in partnership with Qatar's Public Works Authority (Ashghal) as platinum sponsor, WaterWorld Middle East 2013 will showcase Qatar and the region's biggest opportunities in the water sector.

The strategic and technical conference will feature Nasser Al Kuwari, Manager of the Drainage Projects Department at Ashghal, delivering a presentation on Qatar's Inner Doha Re-sewerage implementation strategy (IDRIS) programme.

The IDRIS programme is designed to provide new municipal drainage and wastewater treatment for Doha south area and is set for completion in 2019.

Other event supporters will include the Arab Countries Water Utility Association (ACWUA) and industry analysts, Frost & Sullivan, as the Knowledge Partner.

The conference and exhibition will see over 50 speakers and eminent chairs and speakers from 20 countries around the world deliver presentations and panel discussions in response to the opportunities and challenges in water supply and sanitation in the MENA region.

Top speakers across two conference tracks will include presentations by Dr Corrado Sommariva, president of the International Desalination Association, Khalil Atasi, chief executive officer of CDM-Arabia, Prof Thomas Missmer from the King Abdullah University of Science and Technology (KAUST) and Dr Ilham Kadri, General Manager MEA, Dow Water and Process Solutions, UAE.

Key conference topics to be discussed at WaterWorld's Middle East will include Utility Management; Water Resource Management; Wastewater Reuse; Industrial Water Treatment; Technology Debate: Wastewater Options.

A panel debate on "Desalination's Changing Landscape – Thermal to RO", will bring together representatives of thermal, membrane, hybrid and forward osmosis desalination to discuss the latest projects, results and technologies in lively comparative debate.



#### WATER RESEARCH PROGRAMME -Weekly Bulletin-

Tom Freyberg, Conference Director of WaterWorld Middle East, said: "A clear technology shift is being witnessed in the conversion of seawater to potable, drinking water. For decades Qatar and other Middle Eastern nations heavily relied on giant thermal desalination facilities. Yet increasing water scarcity and lower cost membranes are meaning large scale, plants are coming online. The Peninsula

"Doha to host Middle East water summit next year", 21/12/2012, online at: <u>http://thepeninsulaqatar.com/news/218859-</u> <u>doha-to-host-middle-east-water-summit-next-year-.html</u>

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#### ✤ Project seeks to help people rediscover the Nile

Aiming to inspire, educate and empower citizens to work together to develop innovative solutions addressing the Nile Basin's environmental, social, cultural and economic challenges, the Nile Project is launching its first event next month — a gathering in Aswan.

The Nile Project was founded in August last year by Egyptian ethnomusicologist Mina Girgis and Ethiopian-American singer Meklit Hadero. They hope to create an intercultural dialogue between the peoples of Nile Basin countries using an innovative approach that combines music, education and an enterprise platform.

Girgis, the executive director, says the project is an invitation to see the river in a new light — not just as a waterway, but as a living organism that holds together a complex network of interrelated ecosystems on which tilapias, egrets, crocodiles and papyrus are as dependent as humans for their survival.

"Unfortunately, most of us who live within this system have no idea what these relationships mean. How do all these worlds affect one another? How do they come together to affect the Nile? And what can we do to help restore the balance of this complex system?" he asks.

It's also an invitation to work together to understand the Nile as one system in which fishing, irrigation, tourism and transport are intricately connected to climate change, floods, droughts and dams.

The Nile Project gathering will take place at Fekra Cultural Center in Aswan from 10-29 January. There will be four days of strategic planning workshops, followed by a two-week music residency to develop music that can generate empathy and inspire cultural and environmental curiosity.

Musicians from the 11 Nile Basin countries will collaborate to translate this intercultural dialogue into a new body of songs, drawn from the rich and diverse genres, traditions and instruments found in East Africa.



The project's program includes a Nile tour on a raft made of recycled mineral-water bottles. A collective of musicians and environmental educators will sail down the river from the Mediterranean to Aswan for 35 days, performing concerts and holding participatory workshops to enable local audiences to learn about the Nile's cultural and environmental fabric.

In addition, an educational initiative will be provided, offering a holistic approach to Nile river ecology and its inhabitants with a multidisciplinary curriculum exploring the history, geography, cultures and ecosystems of the Nile Basin.

"It's an invitation to learn from the ways nature organizes itself around this river, and the Nile Project musicians collaborate to explore a new sound that is greater than the sum of its parts," Girgis notes. "I really think the project will provide a good platform for cultivating the critical connections necessary to create a new reality with our environment and an opportunity to think together and take a leap into a more sustainable Nile future."

"Project seeks to help people rediscover the Nile", Egypt Independent, 16/12/2012, online at: http://mideastenvironment.apps01.yorku.ca/?p=6555

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#### Conference: For water and energy security, measures need to be taken now

It is crucial, now more than ever, that steps are taken for water and energy security in Pakistan, else the consequences will be severe.

Experts stated this at a conference on "Water and Energy Security in Pakistan: The Way Forward" organized by the Islamabad Policy Research Institute (IPRI) on Thursday, said a press release issued by the institute.

Sustainable Development Policy Institute (SDPI) Deputy Executive Director Dr Vaqar Ahmed said that poor governance and absence of practical and dynamic policy framework pertaining to the energy sector are the major reasons for the chaotic energy situation in Pakistan.

He said while primary energy consumption in the country has grown by 80 per cent, the situation has worsened due to the government's poor policy framework. He said mismanagement in the energy sector has created a rift between the provinces and the centre, adding that if action is not taken now, the economy will not be able to withstand the fallout.

Ahmed said energy governance is crucial at this time and to accomplish that governing boards need to be allowed to work independently, regulatory bodies' oversight strengthened and appropriate legislative changes taken to allow deregulation.

He said that energy pricing was another aspect that needs consideration, suggesting that subsidies in the sector should be phased out and prices should be determined on an economic basis.

He also lamented that there was not a single consumer specialist in Pakistan, while in India there are 76 such specialists. Lack of demand-side accountability and project-specific legal/institutional arrangements were other important considerations, he said.

Highlighting long-term solutions, Ahmed said that energy crisis can be dealt with by developing a national consensus on hydro and coal sources, establishing a multi-buyer and multi-seller private sector energy market, insulating the gas sector from security threats and increasing the capacity for renewable energy.

Ahmed emphasized on joint techno-economic evaluation of opportunities and determination of prerequisites to improve the energy situation in the country. He suggested seeking support from



multilateral institutions, particularly the Southern Africa Power Pool and Nordel, and electricity trade in Europe.

He suggested that hat there should be only one ministry for the energy sector so that things could be aligned under one authority. He added that the large-scale theft of electricity was being done by "the big fish."

A researcher, Dr Shaheen Akhtar, said Pakistan needed to follow a holistic water resource management strategy to deal with internal and trans-boundary water issues.

She said that Pakistan is a single basin country and its dependence on external water resources was 76 per cent, while that of India is 34 per cent, adding that rising water demand in the two countries are creating trans-boundary issues as well as internal conflicts.

Akhtar said Pakistan must manage its domestic water resources, as a huge amount of water is consumed by its agricultural sector. She said that inefficient irrigation techniques have led to a sharp decline in groundwater level and as a result various wetlands have been wiped out.

The researcher stressed that both India and Pakistan need to work together to monitor and forecast weather changes in the glacial region and the catchments of the upper Indus basin to meet the challenge.

Melting of the Hindu Kush-Karakoram-Himalaya (HKH) glaciers would have serious consequences for the Indus basin, warned Akhtar. She maintained that climate change is a major global threat and key gaps in the knowledge base of the Indus basin should be researched and made public.

IPRI Researcher Mustansar H Billah, called for shifting focus to renewable energy sources. He said though the potential of nuclear energy should not be abandoned, it would require high standard of security to ensure energy production. Moreover, he said Pakistan should not attach high hopes to coal for power generation due to its poor quality. He suggested that focus should be on hydropower.

Though a scientist from the audience pointed out that using coal for electricity generation is cheaper as it is an affordable source and can also be imported, Billah insisted that Pakistan can benefit from technological advancements in renewable energy sources, such as solar and wind, as is India, China and European countries.



He said that Pakistan should step up its efforts to accord with Iran on TAPI gas pipeline in order to meet the challenge of energy shortage.

One of the participants commented, "Problem lies within us," saying that poor governance and incompatible strategy framework that fails to include all stakeholders in the process of energy generation and consumption.

"Conference: For water and energy security, measures need to be taken now", 21/12/2012, online at: http://tribune.com.pk/story/482277/conference-for-water-and-energy-security-measures-need-to-be-taken-now/

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#### **\*** Water level falls in city reservoirs

**Visakhapatnam:** Even as water levels in major sources have been falling significantly because of silt deposition, no worthwhile action has been initiated by the government yet.

Studies have found that while Meghadrigedda Reservoir has lost about 16 per cent of its storage capacity, the Gambhiram reservoir's level has been reduced to a staggering 40 per cent, said Prof. P. Jagadeeswara Rao, head of the department of geo-engineering, Andhra University.

Meghadrigedda is an east flowing non-perennial river rising in the Eastern Ghats at Nandikonda hill and flowing into the Bay of Bengal near old city of Vizag. The reservoir was constructed with the gross storage capacity of 1,169 mcft in 1972 at the confluence of Meghadrigedda and Naravagedda.

The reservoir is one of the major water sources supplying 8 million gallons per day (MGD) to the Greater Visakhapatnam Municipal Corporation (GVMC). In 1989, water withdrawal capacity of the reservoir was increased to 10 million gallons per day.

Meghadrigedda, Nara-vagedda and Borramgedda are three major ephemeral rivers forming the basin area. Owing to change in slope and gullied erosion, the zones contribute huge silt deposition in the reservoir thus reducing its storage capacity.

A study by the geo-engineering department of the Andhra University estimates that silt deposition is around 16 per cent of its storage capacity while the dead storage area is completely filled with sediment.

Another main water source for the city, Gambhiram reservoir, was constructed in 1962 with the gross storage capacity of 112.03 mcft.

The non-perennial Pedda Gedda, a minor watershed located in the hilly terrains of Eastern Ghats Mobile Belt region, has a drainage area of 184.9 sqkm with the reservoir in the middle of the basin.

The study area is divided into 7 micro watersheds on the basis of drainage conditions, which have no role in silt deposition to the reservoir, according to a study. Sheet, gully and stream erosions are mostly responsible for reducing the storage capacity of the reservoir. Micro watersheds No. 5 and 6



adjacent to the reservoir have a rolling topography with moderate slopes, which contribute more silt to the reservoir. As a result, the reservoir's storage capacity has been reduced to about 40 per cent.

Chief Engineer of the GVMC, B. Jayarami Reddy, said the irrigation department has been writing to desilt the reservoirs.

The GVMC has also been in touch with the Central Design Organisation on the Mudasarlova reservoir.

"Water level falls in city reservoirs", 17/12/2012, online at: <u>http://www.deccanchronicle.com/121217/news-current-affairs/article/water-level-falls-city-reservoirs</u>

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#### PM promises national water policy

Kannada Development Authority (KDA) chairman Mukhyamantri Chandru on Tuesday stated that prime minister Manmohan Singh has agreed to convene a meeting of chief ministers of all the states to discuss about finalising a national water policy.

Chandru, who had led a delegation to Delhi recently to demand a national water policy and education policy, said that the prime minister has also given the assurance to the delegation from Karnataka that he would call an all party meeting soon to discuss about the issue.

The delegation included BJP MP Ananth Kumar and noted litterateurs and others. It was aimed at pressurising the central government about the formation of national policy on education, employment and water.

The prime minister had also promised the delegation that as for as national policy on employment is concerned, he would direct the concerned union minister to look into it.

Chandru also explained that the PM had told the delegation that he will agree in principle to form a national policy on education with emphasis on imparting primary education in the medium of the child's mother tongue, however will try to evolve a policy keeping in mind about the languages of all the states in the country.

The delegation also met NDA chairman LK Advani who promised that though it is difficult to implement the national policy on employment, water and education, he would try his best for the implementation.

The delegation also met Union water resources minister Harish Rawat, Union minority development minister K Rehman Khan, Union minister for human resource development MM Pallam Raju, labour minister Mallikarjun Kharge and petroleum minister Veerappa Moily, small industries minister KH Muniyappa and opposition leaders Sushma Swaraj and Arun Jaitley.

Points, the delegation stressed uponEducation policy: National education policy is to be framed with stress on imparting primary education in mother tongue or regional language.

Employment policy: National employment policy has to be formulated with due importance to local people in all employment opportunities.

Water policy: National policy on river water utilisation and interstate water dispute needs immediate attention to redress the issue amicably.

"PM promises national water policy", 19/12/2012, online at: <u>http://www.dnaindia.com/bangalore/report\_pm-promises-national-water-policy\_1779380</u>

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#### Making way for water

Multi business conglomerate ITC Ltd has taken the route of public private partnerships (PPP) with state governments and NABARD in five states under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Integrated Watershed Management Programme (IWMP) and Integrated Watershed Development Programme (IWDP).

The PPP project plans to cover 1,00,000 hectares of watershed development in Andhra Pradesh, Bihar, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu and West Bengal by the end of this fiscal.

ITC started watershed development as part of its corporate social responsibility in 2007 and till date has signed 19 PPPs with State governments and NABARD in five States covering 143,753 Ha under the three schemes.

"Many of ITC's businesses are agri-based. As a result, farming communities are integral to its value chains and their productivity and competitiveness is inextricably linked to that of the company. Responding to the challenges faced by these communities, ITC evolved its Integrated Watershed Development programme with the conservation and management of water and other natural resources and the creation of sustainable livelihoods as its cornerstones," says Dr Asesh Ambasta, Vice President and head, social investments.

There is over 98,000 hectares of land under soil and moisture conservation practices of ITC's IWDP in 25 districts impacting 95,000 households, according to the company.

ITC also works with voluntary organisations as implementation partners to mobilise villagers to form Water User Groups. The company says that these groups are trained to carry out the entire spectrum of activities from implementing soil and moisture conservation measures to building, reviving and maintaining water-harvesting structures to reverse land degradation and extend critical irrigation and raise agricultural productivity.



According to the company, "by the close of the financial year 2011-12 there were 756 functioning Water User Groups, which had a cumulative maintenance fund of Rs. 47.57 lakh. Civil work on structures generated 2.6 million person-days of employment, particularly benefiting the landless."

The majority of the watershed projects are located in areas where ITC's e-Choupal operates and it has its agri- businesses. These watershed development projects enable the company to maintain its water positive status. The total rainwater harvesting potential so far created by the company is twice the net water consumption by its operations, it claims.

"Making way for water", 21/12/2012, online at: <u>http://www.thehindu.com/news/states/other-states/making-way-for-water/article4217955.ece</u>

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#### \* Managing Water in Changing Burma

In a reporter's notebook, Tyler Chapman speaks with farmers and experts about creating a plan for the nation's water usage.

MANDALAY, Burma—The rhythm of prosperity and survival for farmers in much of central Burma has been the same for decades: sesame, rice, peanuts.

Those three crops, planted one after another to coincide with historically reliable weather patterns, have sustained farmers and their families for generations.

Now, the weather is changing and so are their lives. This year, the sesame crop was lost for lack of rain, a financial and psychological setback that left farmers scrambling for alternatives and answers.

For a country with abundant water in the rivers that run south from the Himalayas, Burma is unable to provide either consistent irrigation for its farmers or clean drinking water for its people.

The farmers' predicament this year is seen as another sign that Burma is feeling the effects of climate change on everything from harvests to the supply of water for bathing, cooking and drinking.

"Of course the farmers are worried about climate change," said Tai Lynn, the son of a farm family that lost its sesame. "This trend has been under way for a while now."

Farmers in the Irrawaddy Delta, to the south, say it all began on May 2, 2008, when Cyclone Nargis came ashore and killed up to 138,000 people. Scientists say Nargis was only a precursor to worse storms in the future.

With Nargis came a storm surge that left the farmers' rice paddies and drinking water contaminated with salt water from the Andaman Sea. Then the rainy season, between May and October, started to change.

"These days, the monsoon comes later and leaves sooner," said Tai Lynn, the farmer's son. "That



leaves a shortage of water."

"Normally we have 120 days of monsoon a year and now it's down to 107," said Dr. Khin Ni Ni Thein, secretary general of the Ayeyarwaddy River Basin Research Organization, a water think tank. "And the intensity is no longer predictable."

#### New protests

Floodwaters from heavy rains carry sewage, fertilizer and pesticides into lakes, ponds and wells in rural Burma—the sources of water for millions of people. The dry season parches them.

Rivers that could otherwise provide clean water are polluted with human waste, garbage and runoff from agriculture and mining.

As for the big cities, the water and sewer systems date back to British colonial times and are crumbling from almost 50 years of neglect under the former military dictatorship.

Now that the country is democratizing, people in Rangoon and Mandalay are beginning to protest the lack of clean drinking water, electricity outages that render water pumps useless and sewage systems that overflow in severe rainstorms.

"Life is miserable for people in Yangon (Rangoon)," Dr. Ni Ni said, shortly before the city was pronounced the most unlivable in Southeast Asia.

As if that isn't enough, the government has acknowledged that nationwide tests showed a high level of arsenic in the nation's drinking water, increasing the chances of cancer, vascular disease and brain damage.

"We cannot drink arsenic-contaminated water by any means, even after boiling it," Dr. Than Htut of the Health Ministry told Mizzima.



"People think water from rivers and creeks is dangerous for health as it is contaminated with human waste and other impurities," he said. "So the people switch to groundwater ... But the groundwater is also contaminated ... It is becoming a huge problem."

"Water is a basic human right," Dr. Ni Ni told me. "If we don't have water, how will we survive? I'm very much afraid."

#### Campaign for change

With the help of international aid groups, the government has begun a nationwide campaign to teach Burmese people basic sanitation techniques and how to purify their drinking water.

For generations, rural Burmese have taken their washing and cooking water from often-muddy lakes and ponds, and relied on rain storage tanks and wells for their drinking water. Gastrointestinal diseases are endemic.

At a novice initiation ceremony at a monastery on flooded Inle Lake last year, I saw some people urinating into the lake through holes in the floor on one side of the building and others scooping water from the lake on the opposite side for cooking rice.

"The habitual way of doing things has to change," Dr. Ni Ni said.

She is among water experts and government officials trying to put together a national water plan before Burma's democracy-fueled economic boom gets under way.

"We need integrated water management," Dr. Ni Ni told me. "It can't be done at the cabinet level. It has to come from the highest level ... This is a new paradigm. We are going to have to live with more storms and floods."

"We are talking about the country's development. If we don't have good water, we can't have sustainable development."



As for the farmers in central Burma, they are hoping President Thein Sein's government will act quickly.

"If the new government does not take urgent action on water management and climate change," said Tai Lynn, the farmer's son, "it will be bad not only for the farmers but for all of us."

"Managing Water in Changing Burma", 20/12/2012, online at: <u>http://www.rfa.org/english/commentaries/water-12202012124528.html</u>

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#### \* Extraordinary new species discoveries in the Greater Mekong

A new bat named after its devilish appearance, a subterranean blind fish, a ruby-eyed pit viper, and a frog that sings like a bird are among the 126 species newly identified by scientists in the Greater Mekong region in 2011, and described in a new WWF report, Extra Terrestrial.

Among the ten species highlighted in the report is the aptly named Beelzebub's tube-nosed bat, a diminutive but demonic-looking creature known only from Vietnam. Beelzebub's bat, like two other tube-nosed bats discovered in 2011, depends on tropical forest for its survival and is especially vulnerable to deforestation. In just four decades, 30 per cent of the Greater Mekong's forests have disappeared.

"While the 2011 discoveries affirms the Mekong as a region of astonishing biodiversity, many new species are already struggling to survive in shrinking habitats," said Nick Cox, Manager of WWF-Greater Mekong's Species Programme. "Only by investing in nature conservation, especially protected areas, and developing greener economies, will we see these new species protected and keep alive the hope of finding other intriguing species in years to come."

A new 'walking' catfish species (Clarias gracilentus), discovered in freshwater streams on the Vietnamese island of Phu Quoc, can move across land using its pectoral fins to stay upright while it wiggles forward with snake-like movements. And a dazzling miniature fish (Boraras naevus), just 2cm in length, was found in southern Thailand and named after the large dark blotch on its golden body (naevus is Latin for blemish).

A pearly, rose-tinted fish from the carp family was found in the Xe Bangfai catchment, a Mekong River tributary in Central Laos that runs 7km underground through limestone karst. The cavedwelling Bangana musaei is totally blind and was immediately assessed as vulnerable due to its restricted range.

Mekong River supports around 850 fish species



The Mekong River supports around 850 fish species and the world's most intensive inland fishery. Laos' determination to construct the Xayaburi dam on the mainstream of the Mekong River is a significant threat to the Mekong's extraordinary biodiversity and the productivity of this lifeline through Southeast Asia that supports the livelihoods of over 60 million people.

"The Mekong River supports levels of aquatic biodiversity second only to the Amazon River," added Cox. "The Xayaburi dam would prove an impassable barrier for many fish species, signalling the demise for wildlife already known and as yet undiscovered."

A new species of tree frog discovered in the high-altitude forests of northern Vietnam has a complex call that makes it sound more like a bird than a typical frog. While most male frogs attract females with repetitive croaks, Quang's tree frog spins a new tune each time. No two calls are the same, and each individual mixes clicks, whistles and chirps in a unique order.

When it comes to frogs in the genus Leptobrachium, the eyes have it. Among its more than 20 species, there is a remarkable variety of eye colouration. Leptobrachium leucops, discovered in 2011 in the wet evergreen and cloud forest in Southern Vietnam, is distinguished by its striking black and white eyes.

#### Staggering array of 21 reptiles

A staggering array of 21 reptiles was also newly discovered in 2011, including the ruby-eyed green pit viper (Trimeresurus rubeus) in forests near Ho Chi Minh City. This new jewel of the jungle also winds its way along the low hills of southern Vietnam and through eastern Cambodia's Langbian Plateau.

A short-tailed python species was found in a streambed in the Kyaiktiyo Wildlife Sanctuary in Myanmar. The elusive pygmy python (Python kyaiktiyo) has not been found again despite repeated surveys, so little is known of its ecology, distribution or threats. However, the 1.5 metre-long python is likely at risk from threats faced by other pythons, including habitat loss, and illegal hunting for meat, skins, and the exotic pet trade.



"Poaching for the illegal wildlife trade poses one of the greatest threats to the existence of many species across Southeast Asia," added Cox. "To tackle this threat, WWF and TRAFFIC launched a global campaign this year to increase law enforcement, impose strict deterrents and reduce demand for endangered species products."

Extra Terrestrial spotlights 10 species newly identified by science, among the 82 plants, 13 fish, 21 reptiles, 5 amphibians and 5 mammals all discovered in 2011 within the Greater Mekong region of Southeast Asia that spans Cambodia, Laos, Myanmar, Thailand, Vietnam and the south-western Chinese province of Yunnan. Since 1997, an incredible 1,710 new species were newly described by science in the Greater Mekong.

"Extraordinary new species discoveries in the Greater Mekong", 18/12/2012, online at:

http://wwf.panda.org/about\_our\_earth/search\_wwf\_news/?207082/Extraordinary-new-species-discoveries-in-the-Greater-Mekong&utm\_source=Circle+of+Blue+WaterNews+%26+Alerts&utm\_campaign=17a30f8d19-RSS\_EMAIL\_CAMPAIGN&utm\_medium=email

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#### **\*** Opinion: Mekong River dam threatens livelihoods and ecosystems

*Editor's note:* Tracy A. Farrell is the Senior Technical Director of the Greater Mekong Program and Director of the Freshwater Initiative for Conservation International. Farrell served as Dean for the School for Field Studies and was also a Visiting Professor/Instructor for Virginia Tech's Department of Forestry.

(CNN) -- Last month the Cambodian government announced their plans to build a dam on one of the Mekong River's most important tributaries, the 3-S River Basin, in 2014. This was declared just five days before the government of Laos held their ceremony to launch the construction of the controversial Xayaburi dam, the first dam to be built on the lower Mekong River.

<u>Conservation International</u> along with other conservation groups working in the region are extremely concerned by this move and have requested a delay on this decision to allow time for research to better understand the trade-offs between power generation and the dam's impacts, and the opportunity to offer sustainable alternatives for Cambodia's economy.

In Cambodia today only about 5% of infrastructure projects go through the Ministry of Environment's Environmental Impact Assessment process, and when they are completed, they often do not include detailed studies of the full range of environmental impacts.

Such considerations are crucial for the Greater Mekong region's development pathway and will ensure that these countries are protecting yet utilizing their natural assets for the benefit of their people, their economy and the environment.

The 3-S River Basin (Sekong, Sesan and SrePok Rivers), borders Laos, Cambodia and Vietnam, and supports 20% of the Mekong River water flows, ensuring food and water security for millions of people living in the basin. It also contains some of the region's most unique and rare biodiversity including yellow cheeked gibbons and Asian arowana (dragon fish), among many other endangered and charismatic species.

Principally our concern is for the people who rely on the water flows of the lower <u>Mekong River</u> for their food, health, income and other essential livelihood securities. This includes the people who live in the 3-S River Basin, the 1.1 million people that depend on the Tonle Sap and another 60 million people living on the Mekong Delta.



Our economic concern is that dams on the Lower Mekong will likely reduce the productivity of the region's agriculture and aquaculture industries, particularly in Cambodia and Laos, and plunge them back into even more severe poverty then they currently suffer.

A recent assessment of the 42 dams proposed for the river basin found that they are likely to produce substantial changes to the natural fluctuation in the seasonal flow. This would have severe impacts on the natural delivery of nutrients and other critical aspects that are required for agricultural and fisheries productivity.

In Cambodia fish provide 85% of the population's protein needs and an essential source of fat. Right now the Cambodian per capita in-take of fats is the lowest in Southeast Asia and the most essential of these, the omega-3 fats which come from fish, are the least available. If there was a reduction in fish populations, nutrition and health will decline on a national scale and further deepen Cambodia's current situation of severe poverty.

The biodiversity underpinning the ecosystem productivity and life that has thrived for thousands of years is in danger. Of all the various impacts on the horizon as a result of this development, the most serious is the potential for major changes to the migration patterns of fish. A recent environmental impact assessment of the Lower Sesan 2 dam concluded that the impacts on fish populations will be very severe.

As approximately 66% of the Mekong fish species are migratory their passage will be blocked by the dam in its current design which will seriously reduce the reproduction rate and overall fish populations downstream will be reduced.

If this traditional migration is hindered it could lead to a serious decline in fish reproduction which will unbalance the delicate food chain on which this ecosystem depends. This has already happened in other dam developments globally, due to lack of adequate planning and understanding of the dams effects.

Before the construction of the Pak Moon dam in Ubon Ratchathani province, Thailand, the waterway contained over 250 species of fish. This plummeted over 80% when the dam began operation, and a decade later, through extensive government investment to restock the river, the species number is still less than half the original amount. More than 20,000 people have been affected by this loss of fish. This dam was anticipated to have a production capacity of 136 megawatts, but it can barely generate 20 megawatts during high-demand months.



Conservation International support the development of electricity generation for domestic consumption and export as these are critical components of development for Laos, Cambodia and Vietnam. We believe that the Greater Mekong region has the potential to become a world leader by pursuing an innovative, low carbon, green development pathway that will foster economic growth and create opportunities for its people, while conserving the natural environment.

However, this region needs integrated hydro-power development and conservation planning so that the trade-offs between energy production and other ecosystem services, particularly those vital for the survival of the people that depend on them, are better understood before such dams are developed.

A delay will allow for the delivery of decision support tools that can explain how different scenarios, such as variances in the dam location, design and operation will influence their impacts. Careful consideration must be made now of the potential impacts of this, and other dams being considered for the 3-S River Basin, to avoid serious losses and to form a positive solution for the people of the lower Mekong, their energy needs and the environment on which they depend.

"Opinion: Mekong River dam threatens livelihoods and ecosystems", 19/12/2012, onlineat: http://edition.cnn.com/2012/12/18/opinion/opnion-mekong-river-dam/

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#### Setting on Hunger: Is Financial Speculation to Blame for High Food Prices?

Remember the food crisis of 2007 and 2008, when rapid and extreme increases in global food prices led to riots and civil unrest in 28 countries? While we have yet to see unrest on the same level since, the shadow of that crisis, and the debate as to what the systemic causes were, remains. At the end of November, the <u>World Bank warned in its Food Price Watch report</u> that high and volatile prices are the "new normal." In a world where nearly 1 billion people live in hunger — an estimate that Jomo Sundaram, assistant director general of the U.N. Food and Agriculture Organization (FAO), describes as conservative — high food prices can be fatal.

The shift in prices affects <u>consumers</u> in rich countries, who will see their grocery bills rise at a time when wages in much of the world are stagnant. But the real impact is felt by the global poor, in places like Tajikistan, where individuals spend nearly 80% of their income on food. Price spikes in those places can be devastating, even deadly. Prices of agricultural commodities are now 7% higher than a year ago. Wheat and grain prices are especially high, with the former heavily impacted by crop failure in the U.S., <u>Russia</u> and other regions.

#### (MORE: Food Fight! Stores, Producers, Consumers Battle over High Food Prices)

There are obvious factors at play here: poor weather, including <u>drought</u> in the U.S. Corn Belt, as well as the growing demand for grain from the biofuel industry and from consumers in places like India and China who are transitioning to a more meat-heavy diet. (It takes more than 15 lb. of grain to produce 1 lb. of beef.) For an increasing number of experts however, these factors do not go far enough in explaining what has caused food prices to spike since the 2000s, reversing what had been a four-decade-long trend of declining prices.

Instead, experts are pointing toward financial actors who have increasingly moved into the agricultural markets to bet on future prices of these commodities. <u>Yaneer Bar-Yam and Greg Lindsay of the New England Complex Systems Institute argue that mathematical models show that only speculation</u> — and not mere supply and demand — can explain these spikes. Bar-Yam's group used these models to test the links between the possible reasons for the price spikes and found that when compared against actual prices between March 2011 and January 2012, the model pointed to speculation and ethanol conversion as the underlying cause.

#### (MORE: <u>A Future of Price Spikes</u>)

Not everyone agrees that it is that simple. Ann Berg, a former trader on the Chicago Mercantile Exchange and now an adviser to the FAO, says that while this trend has been noted, you "cannot prove causality" between the role of these speculators and the artificially high prices.



Traders have always speculated on the agricultural-commodities futures market, just as they do in other commodities like copper or oil. Those with an actual commercial interest — food producers and buyers — use this market to bet against price increases and decreases as a form of insurance against volatility. But after 1999 and 2000, when sections of the Glass-Steagall Act were repealed and President Bill Clinton signed the Commodity Futures Modernization Act into law, investment banks and other financial actors began to bet on commodities as speculation, not as insurance. "Where we used to see something like 12% of the market made up of financial players, since deregulation, this number has now jumped to over 60%," says Heidi Chow of the <u>World Development Movement</u>, a U.K.-based campaigning organization.

#### (MORE: <u>Why the New Ken Burns Documentary on the Dust Bowl Has Lessons to Teach Us</u>)

The statistics are impressive: the German NGO Foodwatch points out that investment in <u>food</u> commodities has jumped from \$65 billion to \$126 billion in the past five years. Perhaps a more revealing statistic is that speculative investment in these commodities in 2011 amounted to <u>20 times</u> more than the total spent on agricultural aid by all countries combined.

These facts alone do not necessarily implicate speculators as the boogiemen responsible for food price volatility, though the perception of financiers gambling and profiting as millions starve is a powerful one. Over the summer some European banks tentatively pulled out of these markets, either by withdrawing vehicles that allow investors to speculate on food commodities or by promising to not introduce new ones. Similarly, Rich Ricci, chief executive of Barclays' investment arm, <u>hinted before a U.K. government committee on Nov. 29</u> that his bank would consider ceasing to trade in agricultural products because "it does not sit socially well with a large constituent of our customers." According to the World Development Movement, Barclays Capital made nearly \$548 million from agricultural speculation in 2010.

Campaigners and regulators are nevertheless keen to introduce caps and limits on food speculation. As Brett Scott, a former London broker, <u>explains</u>, while it is difficult to pin the blame on speculation, which has always played a role in providing needed liquidity to markets, the volatility of these commodities has attracted a significant number of technical traders who "<u>speculate on market</u> <u>patterns formed by the actions of other traders</u>." It's their role that is key to understanding how the market has almost short-circuited, disconnecting from the realities of supply and demand and causing havoc, misery and high prices for both producers and consumers.

#### (PHOTOS: <u>A Global Food Crisis</u>)

For regulators, the difficulty is in establishing how much speculation is too much. Speaking before the FAO in Rome in October, <u>Bart Chilton of the U.S. Commodity Futures Trading</u> <u>Commission</u> (CFTC), who is pushing for regulatory caps through position limits, posed this very question to the audience: "By a show of hands, if one trader controlled 85% of a market, could they



#### WATER RESEARCH PROGRAMME -Weekly Bulletin-

manipulate prices?" He received an almost blank response, according to Ann Berg. She points out that there is no working definition of what excessive speculation is, though there is a growing concern about the ability of these investment funds to "move markets," as Chilton put it.

A possible solution to curbing these investors' impact on real-world prices has been written into the Dodd-Frank legislation, authorizing the CFTC to set limits on percentages of specific commodity products that can be held by a single entity. Michael Dunn, a former CFTC commissioner, expressed doubts about these limits, describing them as "a cure for a disease that does not exist, or at worst, a placebo for one that does." His pronouncement is yet to be tested; in October, Judge Robert Wilkins of the Washington, D.C., district court struck down this rule. For its part, the CFTC plans on appealing his decision. It may be the case that by the time regulation is in place, investors have lost their interest in commodity speculation, if only because of the poor optics for banks. For the world's starving, however, this may be too little, too late.

"Betting on Hunger: Is Financial Speculation to Blame for High Food Prices?", 17/12/2012,online at: http://science.time.com/2012/12/17/betting-on-hunger-is-financial-speculation-to-blame-for-high-food-prices/

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#### ✤ Water gets smart to cut consumption

World's first 'smart river' shows technology is the best way to ensure the optimal use of scarce resources, say investors

New technologies capable of monitoring the water cycle is key to managing our use of water in the most optimal way, according to experts speaking at the recent Investment Week climate change conference in London.

Taking irrigation as an example, Dr David Lloyd Owen, an advisory board member of the Pictet Water Fund, explained that one of the greatest causes of crop inefficiency is over-watering. But once you install smart water management systems with probes in the earth telling you exactly how much water you need, when and where, you not only save water, you improve yields. And those who have introduced smart irrigation techniques in America, Africa and Europe have quickly reaped the rewards.

Similar ideas are also showing signs of success in managing floods. In France, for example, Dr Lloyd Owen explained they now have the first smart river, which is being monitored by Suez Lyonnaise. The entire length of the river is linked up with probes to give real-time data on the flow of water. This gives between two and 24 hours prediction time to deal with changes in water flow, which is likely to save governments a lot of money in dealing with floods.

Lowering water consumption is another area Dr Lloyd Owen said is seeing innovative technology solutions.

In Las Vegas, for example, residents are given a rebate if they swap their lawn for gravel. As a result they are actually using less water in Las Vegas today than they did 20 years ago, despite the city being two and a half times the size.



Other innovative ideas that are gradually being introduced to reduce water consumption include air flushes in toilets and silicon particles in dishwashers and washing machines, which reduce water use by as much as 80 per cent, as well as using less energy.

The need to treat waste as a resource also needs to be put on the political agenda, according to Dr Lloyd Owen. He said every unit of waste water that goes into a waste water treatment works should be able to generate up to four times as much energy as is required to treat and recycle it.

This not only gives the potential to export water from waste water treatment and sludge recovery plants back in to the water cycle, but also offers the prospect of completely de-carbonising the water sector. However, efforts are needed to address public fear of the use of recycled water.

In Singapore, for example, this is achieved through a new water project where retained waste water is put either into direct, non-potable use by industry or indirect potable use where it goes into a reservoir and is re-treated.

"Water gets smart to cut consumption", 21/12/2012, online at: <u>http://www.businessgreen.com/bg/news/2232586/water-gets-smart-to-cut-consumption</u>

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#### \* In Dominica, Diminished Rivers Among Climate Change's Effects

**ROSEAU, Dominica, Dec 17 2012 (IPS)** - Eighty-year-old Rupert Lawrence has been living in the Dominica capital, Roseau, for nearly 60 years. Like visitors to the island, he too is fascinated by the fact that the town square has a river running right through its centre.

Sitting on his veranda on River Street overlooking the Roseau River, Lawrence recalled the words of many visitors who would remark that until then, they had never seen a river in the centre of town. But over the years, Lawrence has witnessed the transformation of the Roseau River from a deep diving spot attracting people from all over the island to a mere spring no longer suitable for swimming.

To put it bluntly, in the words of Bernard Wiltshire, an attorney who is president and founder of Waitkbuli Ecological Foundation (WEF), the Roseau River is drying up, like all the others on the island.

"They've been drying up because people have been using land without concern for the rivers," he said. "That Roseau River, you could jump from the bridge into the river; head dive into the river. I remember in 1980 we could sit on the wall and dangle our feet in the water."

Thirty years later, "the river has lost far more than two-thirds of its volume of water, and this pattern is repeated throughout the island," Wiltshire added. He lamented that the Layou River, about seven miles north of the capital, which used to be the largest river in the country, is now "only a sand bank".

Former national disaster coordinator Cecil Shillingford told IPS that local environmentalists have long expressed concern that the island's rivers are drying up. He believed that development had allowed river banks to become heavily habitable.

"A lot of people pay no regard to maintaining a sort of a buffer zone along the banks of the river so they just cut everything down or even sometime rear animals on the river banks that would certainly destroy all the foliage and they would cut the trees for agricultural pursuits," said Shillingford, who is also a disaster risk management consultant.

He said that unless there is "a radical shift in our approach to these things...the next generation might not have a Roseau River or a Grand Bay River." He added, "A lot of policies in terms of land use



planning and buffer zones and things of that nature need to be put in almost immediately. We are already late."

#### Other danger zones

"In terms of coastal residences we need to start building a little further away, so there should be another buffer zone in terms of coastal communities," Shillingford told IPS.

Wiltshire said such developmental and agricultural activities have a big part to play in climate change, and Dominica is seeing its effects. "It's largely from the big industrial countries which seem to put their greed before the need of everyone else," he said.

Shillingford agrees that the effects of climate change on Dominica are clear. "In recent times we have seen lots more rain...[and] more intense rain. Before, you could have a day of rainfall and you would not see any major flash flooding or even flooding in general, but now if you have a day of rain it is so intense that you could have flooding."

"We have seen an increase in storms as well; the intensity has increased and we are certainly seeing some effects in terms of sea level rise," Shillingford added. He noted that "before, the sea would be further away from the community". Now, however, "It's coming up to the community".

In Dominica, he explained, "most of the habitation is on the coastal areas, and the western side…is much lower at sea level than the eastern side," he added.

#### **Combating potential consequences**

One of Dominica's efforts to combat these issues is the recently formulated Low-Carbon Climate-Resilient Development Strategy, which identifies areas that climate change is most likely to affect – namely agriculture, fisheries and ecotourism.

Shillingford noted that coastal infrastructure always takes a heavy beating during a storm. The government has to spend millions of dollars reconstructing roads after every storm. He said although massive walls are being built with government funding along the coast in many villages to combat the effects of climate change, they do not provide complete protection.



Even with a massive wall along the Dame Eugenia Charles Boulevard in the capital, the whole road was torn apart as a result of Hurricane Lenny in 1999. Nevertheless, without the wall, Shillingford said, an entire section of the capital would have been devastated.

"We had at least four or five feet of water on the road...so not even the sea walls are foolproof for the kind of effects we can have from major storm surges," Shillingford said. He is even more concerned about tsunamis, which he said "would be the end of everybody on the west coast" of the island. "You would have half of Dominica gone."

"In Dominica, Diminished Rivers Among Climate Change's Effects", 17/12/2012, online at: <u>http://www.ipsnews.net/2012/12/in-dominica-</u> diminished-rivers-among-climate-changes-effects/?utm\_source=Circle+of+Blue+WaterNews+%26+Alerts&utm\_campaign=d141ba9ce4-<u>RSS\_EMAIL\_CAMPAIGN&utm\_medium=email</u>

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#### \* Water release, rain and snow improve dangerously low water levels on Mississippi River

ST. LOUIS – A release of water from the Missouri River and recent storms are offering some relief for the Mississippi River, where water levels have been dangerously low.

The Mississippi River channel at St. Louis was roughly 12 feet deep on Thursday — up about a footand-a-half since Monday.

River interests are paying close attention because if the Mississippi channel gets to 9 feet, more restrictions for barge traffic are expected. Forecasters initially expected the river to get to 9 feet by late this month.

National Weather Service hydrologist Mark Fuchs now says that probably won't happen until the second week of January. He cites two reasons for the improved forecast: This week's release of water from an upper Missouri River dam; and heavy snow and rain in the upper Midwest.

"Water release, rain and snow improve dangerously low water levels on Mississippi River", 20/12/2012, online at: http://www.foxnews.com/us/2012/12/20/water-release-rain-and-snow-improve-dangerously-low-water-levels-onmississispi/?utm\_source=Circle+of+Blue+WaterNews+%26+Alerts&utm\_campaign=10183a277b-RSS\_EMAIL\_CAMPAIGN&utm\_medium=email

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