

Climate Change and Environment in the Arab World

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Hamed Assaf

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He received his Ph.D. in civil engineering (water resources) from the University of British Columbia in 1991. At BC Hydro, he conducted several impact assessment studies related to hydroelectric development and operation including assessing the potential impact of climate change on the Peace and Upper Columbia watersheds in Canada. His research interests include integrated water resources management, simulation of water and environmental systems and GIS applications.

The Issam Fares Institute for Public Policy and International Affairs (IFI) at the American University of Beirut (AUB) was inaugurated in 2006 to harness the policy-related research of AUB's internationally respected faculty and other scholars, in order to contribute positively to Arab policy-making and international relations. IFI is a neutral, dynamic, civil, and open space that brings together people representing all viewpoints in society. It aims to: raise the quality of public policy-related debate and decision-making in the Arab World and abroad; enhance the Arab World's input into international affairs; and, enrich the quality of interaction among scholars, officials and civil society actors in the Middle East and abroad.

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Governments should practice 'water demand management' to rescue region's water resources

Surging populations and increasing living standards in the Middle East are exacerbating the region's water problem as countries begin to expect more of scarce and poorly managed water, warned Dr. Hamed Assaf, a professor of water resources engineering at the American University of Beirut.

High water demand, negligence of water quality, and over-pumping are more serious threats to the region's water supply than are the potential impacts of climate change, argued Assaf at the second lecture of the Issam Fares Institute for Public Policy and International Affairs (IFI) inaugural series on climate change.

"Though we have little water, we don't take care of it," said Assaf. Lebanon and Egypt face water quality and distribution problems. Untreated sewage from Cairo ends up in the Nile Delta lakes used for fishing, while Beirut suffers from water scarcity due mainly to inadequate water transfer and storage capacity.

Jordan and the Palestinian Territories "are in trouble" with severe water scarcity as their naturally meager resources are inadequate in meeting the demand of rapidly growing populations. Meanwhile, over 80 percent of the region's water is used for agriculture – a significant allocation that could be diverted to municipal use if foods could be imported rather than grown, some experts argue, said Assaf.

National governments across the region will confront the need for better water resource management as their countries begin to feel the effects of global climate change. But the water problem can be mitigated now through 'water demand management,' said Assaf.

“Water scarcity is a problem of demand as much as it is a problem of quantity.”

Climate change under question

Climate change will affect the quantity, quality, and distribution of water – but quantity is not a threat in itself, says Assaf: "Scarcity is a big problem, but scarcity is not just about quantity. It's also about demand."

Water demands are expected to skyrocket, more as a result of surging populations and living standards rather than rising temperatures: "Most of the global warming is happening in Central Asia, North America, and parts of Africa," said Assaf. "The Middle East for the past 55 years has not really warmed up much," he noted, with some parts of the region, such as Turkey, experiencing cooling.

Accordingly, Assaf urged a better understanding of climate change as a hypothesis that is "under question, still" and reiterated global warming "is not just a single number." He cited a 2006 National Science Foundation report by world renowned experts that shows global surface temperature as increasing for the past four centuries, "but go back before 1600 AD, and we have some doubts."

Some records show warming during medieval times to be higher, urging a reconsideration of the idea that recent warming is unprecedented over the past millennium. "It is important for us to communicate to policymakers that yes, there is global warming, but there is high uncertainty with the data," said Assaf.

The Research and Policy Forum on Climate Change and Environment in the Arab World provides a mechanism that brings together AUB professors, other academics and researchers, civil society, the private sector and policymakers. By promoting close interaction between researchers and policymakers, it aims to help formulate more effective environmental policies in the Arab World, and to mitigate the impact of expected climate change scenarios and other environmental challenges. The AUB-IFI Climate Change Forum comprises lectures, research, publications, comprehensive regional databases of scholars and research, and regular workshops, seminars and conferences.

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You can listen and watch the lecture on Youtube on IFI website:
<http://staff.aub.edu.lb/~webifi/>


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Water resources under pressure

The water scarcity problem in the region is going to get worse, according to climate models, which predict a northerly shift in the Westerlies and stronger monsoon system that will bring dry and warm conditions to the region, with the exception of Egypt. Monsoons will increase precipitation in the Nile's headwaters, rendering the projected impact of climate change on Egypt's water resources distinct from its neighbors in the region. "We, on the other hand, are going to run into trouble," said Assaf, referring to Lebanon, Syria, Jordan, and the Palestinian Territories.

If the above trend continues as projected, Assaf explained, the desert will start to move north on a larger scale; temperatures will increase creating more demand for water; floods will become more intensive and frequent, risking damage to infrastructure and lives; and the sea level will rise, compounding the sea-intrusion problem which spoils coastal aquifers with sea water.

Sea-intrusion is a major problem in Beirut, where sea water already intrudes into the coastal aquifer due to over-pumping. A rise in sea level will put more pressure on the aquifer, damaging structures and beaches. Lebanon—which already lacks water storage capacity—will also suffer with the increased sedimentation of reservoirs. In Egypt, a rise in water level of more than one meter beyond the sand dikes which protect the Nile Delta will affect 3.8 million people and 4,500 square kilometers of land.

“Water demand management is one of the most effective ways to adapt to climate change in the long-term.”

Populations under pressure to adapt

"Adaptation is considered a no-regret approach," said Assaf, "because adapting to climate change will benefit and leverage efforts in managing water scarcity." Drought and flood planning are necessary, including the development of water storage and transfer capacity.

Water pumping in coastal areas needs to be regulated to control sea water intrusion. Desalination of sea water is feasible for the Gulf countries due to abundant energy supplies and lack of natural water resources, but Assaf believes it is too costly for the other Arab countries. The transfer of water from the agricultural sector is another adaptation option, suggested by those who argue that the region does not seriously lack water, rather simply misuses it.

Reforestation—restoring the Earth's natural water reservoirs—is also an option, said Assaf, but he maintained that man's effect on climate has been minimal until the last few decades, and thus adaptation measures should not be geared to restoring the environment when little man-made damage has been done.

One of the most effective adaptation measures in controlling the long-term impacts of climate change on water, water demand management focuses on water pricing, legal control and education. ■


Other lectures in the Research and Policy Forum on Climate Change and Environment in the Arab World 2008 Lecture Series:

“Climate Change and Carbon Emissions Trading in the Arab World: A Realistic Answer to the Dangers Ahead?” Jad Chaaban, Assistant Professor of Economics, AUB and Souheil Abboud, Middle East Regional Director, EcoSecurities Group plc.

“Post- Kyoto Policies: How Can Arab Countries Meet Climate Change Challenges after 2012?” Wael Hmaidan, Executive Director of IndyAct - The League of Independent Activists

“Are Changes in Insect Patterns in the Lebanese Mountains Evidence of Climate Change?” Nabil Nemer, Research Associate at the Faculty of Agricultural and Food Sciences, AUB

“Climate Change and the Arab World: Effects and Practical Implications for Water, Land, Food, and Urbanism” George J. Nasr, Professor at the Faculty of Engineering, Lebanese University

“Seawater Intrusion in Greater Beirut: Current Situation and Early Signs of Climate Change” Mark Saadeh, Instructor of Oceanography, Geology Department, AUB

“The Tripod of Academia, Government and Private Sector: From Science to Policy Making” Berj Hatjian, Director-General of the Directorate General of the Lebanese Ministry of Environment