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American University of Beirut
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The American University of Beirut and Texas A&M University Water-Energy-Food Nexus Webinar



HIGHLIGHTS & VIDEO LINKS

December 2018

The American University of Beirut (AUB) and Texas A&M University (TAMU) hosted a webinar on November 27, 2018, to present the findings of the ‘San Antonio Case Studies of the Texas A&M WEF Nexus Initiative,’ which were published in a Special Issue of Science of the Total Environment (STOTEN): *Opportunities in the Water-Energy-Food Nexus Approach: Innovatively driving economic development, social well-being, and environmental sustainability*.

The webinar represents the culmination of the experience of the Texas A&M University Water-Energy-Food Nexus Initiative (WEFNI) in creating a University wide, four year, investigatory experience in support of planning for the water, energy, and food resource nexus in San Antonio and surrounding regions and as climate and urban growth alter water supplies. The System wide effort was led by Professor Rabi H. Mohtar, WEFNI Coordinator, TEES Research Professor, Texas A&M University, College Station Texas, and Dean, Faculty of Agricultural and Food Sciences (FAFS), American University of Beirut (AUB). Members of the Coordinating committee for the project include: Bruce McCarl, Kent E. Portney, Efstratios N. Pistikopoulos, Rudolph A. Rosen, Jack Baldauf, and David Baltensperger.

The webinar offered a discussion of the outcomes of 10 research articles reflecting the process of creating interdisciplinary teams and presenting an overview of the two-year period, during which the research was carried out. Thematic foci include data and modeling, trade-off analysis, water for food, water for energy, and governance. Prior to the publication of the Special Issue, two general stakeholder engagement meetings and several town halls were convened in an effort to better understand the challenges and the benefits of crossing disciplinary and sectoral boundaries to achieve a holistic understanding of the challenges facing resource management and allocation. The webinar also introduces the AUB initiative, led by Mohtar: The Water-Energy-Food-Health Nexus Renewable Resources Initiative, (WEFRAH). This initiative builds on the work begun at TAMU and paves the way for new collaborations, partnerships, and engagement between the two institutions per the recently signed AUB-TAMU MoU

Lessons learned (in brief):

- System-of-systems quantification of water, energy, food, and related systems are similar across hotspots.
- Challenges posed are bound by local knowledge, physical constraints, and governance,
- Solutions must be contextualized locally
- Interdisciplinary teams are an iterative process that requires time and energy
- Interdisciplinary approaches to developing solutions expands opportunities for economic development and social well-being.

Materials (papers and recording)

Videos of the full discussion are also available at the AUB-FAFS and Texas A&M WEFNI websites. Below list each topic (presenter indicated by asterisk).

I- INTRODUCTION – Welcome Note (Mohtar)

WEF Consortium, milestones, and moving forward/ SDG application (5 min)

Daher, B., *Mohtar, R. H., Davidson, S., Cross, K., Karlberg, L., Darmendrail, D., Ganter, C.J., Kelman, J., Sadoff, C., Nahon, C., Fonseca, G., Comby, J., Lavarde, P., Abicalil, T., Aldaco-Manner, L., Schweitzer, M. (2018). **Multi-stakeholder Dialogue: Water-Energy-Food (WEF) Nexus and Implementing the SDGs. IWRA Policy Brief No. 2**

Raya Marina Stephan, Rabi H. Mohtar*, Bassel Daher, Antonio Embid Irujo, Astrid Hillers, J. Carl Ganter, Louise Karlberg, Liber Martin, Saeed Nairizi, Diego J. Rodriguez, & Will Sarni (2018): **Water–energy–food nexus: a platform for implementing the Sustainable Development Goals**, *Water International*, DOI: 10.1080/02508060.2018.1446581



ii- **SPECIAL ISSUE: Science of the Total Environment (Articles)**

LESSONS LEARNED

***Mohtar, R. H., & Daher, B.** (2019). Lessons learned: Creating an interdisciplinary team and using a nexus approach to address a resource hotspot. *Science of the Total Environment*, 650, 105-110. doi:10.1016/j.scitotenv.2018.08.406



MODELING

Dargin, J.S., Mohtar, R.H., *Daher, B., 2018. Complexity versus simplicity in water energy food (WEF) nexus assessment tools. *Sci. Total Environ.* Elsevier.

<https://www.sciencedirect.com/science/article/pii/S0048969718335174>

TRADE-OFF ANALYSIS

***Daher, B.**, Lee, S., Mohtar, R.H., Asaka, J.O., and VanDeveer, S.D. (2018). Security, climate change, and the resource nexus. Chapter 4 in Routledge Handbook of the Resource Nexus. Editors Raimund Bleischwitz, Holger Hoff, Catalina Spataru, Ester van der Voet, Stacy D. VanDeveer. Routledge, UK and NY, 26 pages. ISBN: 978-1-138-67549-0

Mohtar, R.H., Shafiezadeh, H., *Blake, J., Daher, B., 2019. Economic, social, and environmental evaluation of energy development in the Eagle Ford shale play. *Sci. Total Environ.* 646 (2019), 1601–1614. <https://doi.org/10.1016/j.scitotenv.2018.07.202> Elsevier.

***Kulat, M.**, Mohtar, R.H., Oliviera, F. Guiding Water Resources Planning Using the Holistic Water-Energy-Food Nexus Approach: Case of Matagorda County, Texas (In Review).

WATER and ENERGY

Bhojwani, S., Topolski, K., Mukherjee, R., *Sengupta, D., El-Halwagi, M.M., 2019. Technology review and data analysis for cost assessment of water treatment systems. *Science of the Total Environment* Elsevier. (in review).

***Mroue, A. M.**, Mohtar, R. H., Pistikopoulos, E. N., & Holtzapple, M. T. (2019). Energy Portfolio Assessment Tool (EPAT): Sustainable energy planning using the WEF nexus approach – Texas case. *Science of The Total Environment*, 648, 1649-1664. doi:10.1016/j.scitotenv.2018.08.135

WATER and FOOD

***Loy, S.**, Assi, A.T., Mohtar, R.H., Morgan, C., Jantrania, A., 2018. The effect of municipaltreated wastewater on the water holding properties of a clayey, calcareous soil. *Sci.Total Environ.* <https://doi.org/10.1016/J.SCITOTENV.2018.06.104> Elsevier.

***Tahtouh, J.**, Mohtar, R., Assi, A., Schwab, P., Jantrania, J., Deng, Y., Munster, C., 2019. Impactof brackish groundwater and treated wastewater on soil chemical and mineralogicalproperties. *Sci. Total Environ.* (2019), 99–109 <https://doi.org/10.10>

GOVERNANCE and FINANCING

***Aldaco-Manner, L.**, Mohtar, R., Portney, K., 2019. Analysis of four governance factors on efforts of water governing agencies to increase water reuse in the San Antonio Region. *Sci. Total Environ.* <https://doi.org/10.1016/j.scitotenv.2018.07.366>.

***Daher, B.**, Hannibal, B., Portney, K., Mohtar, R.H. 2019. Towards Creating an Environment of Cooperation between Water, Energy, and Food Stakeholders in San Antonio accepted *Sci. Total Environ.* (2019).

II- **MOVING FORWARD** – AUB’s WEFRAH, adding the health component

Rabi H. Mohtar, Professor and Dean, Faculty of Agricultural and Food Sciences and Iman Nuwayhid, Professor and Dean, Faculty of Health sciences, American University of Beirut.

