



Water Resources Management in the Middle East

Spring 2024

Clive Lipchin, PhD, Lecturer, Dr. Annette Huber-Lee, guest lecturer for short course

2-hour lecture once a week plus four-day short course on Water and Economics.

3 credits. Undergraduate

Course Synopsis

This course will introduce the major issues hindering or allowing for efficient water management in the Middle East. As water scarcity is a reality in the region, it is critical to explore the ways and means for sustainable management of this resource in the face of growing demand and dwindling supply and the associated regional plans for water allocation among the countries of the region. The course will concentrate on the Jordan River and Dead Sea Basin and associated groundwater resources and how these waters are managed and shared. The course will focus on the water resources of Israel, the Palestinian Authority and Jordan. The goal of the course is to provide students with an overview of the challenges facing policy makers and water experts in effectively managing these shared resources and negotiating over their equitable allocation.

Short course description: Water scarcity, pollution, and mismanagement are critical challenges that have profound implications for economies globally. This short course delves into the intersection of water and economics, examining how water-related issues impact economic systems and how economic forces, in turn, influence water management strategies. Students will explore the impacts of different policies on water access and infrastructure in the context of Palestine and Israel, using the MYWAS model, to understand tradeoffs around cooperation and non-cooperation.

Grading

Attendance & participation	15%
In class group presentation	25%
Short Course: Short paper on the value of water	20%
Short Course: Final report and presentation	20%
Final Exam	20%
Total	100%

Readings

Readings will be assigned and required for the in class group presentations.
Additional readings for lectures and the presentations will be posted to the Google Docs site for the course.

Topic One – Feb 11

- Introduction to contemporary water issues: where water comes from, when it's available, how it's used and why this is all important

Topic Two – Feb 18

- Defining Water Scarcity: Definitions, Perceptions and Projections

Topic Three – Feb 25

- Overview on Transboundary Water Interactions: Conflict and Cooperation

Topic Four – March 10

- Water Resources and Management in Israel

Topic Five – March 17

- Water Resources and Management in the Palestinian Authority

Topic Six – March 24

- Water Resources and Management in Jordan

Topic Seven – March 31

- Mega-engineering projects for restoring the Dead Sea and resolving the region's water crisis

Topic Eight – April 7

- Transboundary Wastewater policy, treatment and reuse
- Off grid technologies for water and wastewater management

Topic Nine –April 21

- Wastewater epidemiology

Topic Ten –May 5

- International Environmental Law for Transboundary Water Management

Topic Eleven – May 12

- In class group presentations I

Topic Twelve – May 19

- In class group presentations II

Short Course: Water and Economics: Applying the Multi-Year Water Allocation System (MYWAS) model

One daily lesson for 4 days (1.5 hours' instruction and 1.5 hours hands-on) and presentations of final results – April 14-18

Lesson 1: Introduction to the value of water and basic economics

- What are the multi-faceted roles that water plays in our lives?
- Human rights to water
- How does economics relate to resource scarcity?
- How is economics different from finance?

Reading: <https://www.accaglobal.com/gb/en/student/exam-support-resources/fundamentals-exams-study-resources/f1/technical-articles/introduction-to-microeconomics.html>

Hands-on activity: Interview 5 fellow students/faculty about their perceived value of water

Lesson 2: Introduction to the economics of water and MYWAS

- Report back on survey results
- Assess the challenges and opportunities of assigning economic value to water, considering environmental and social factors.
- Understand the economic implications of water scarcity on local, national, and global scales.
- Explore the principles of resource allocation and the economic decision-making processes related to water use.
- Introduction to the MYWAS software

Reading: Fisher, Franklin M., and Annette T. Huber-Lee. "The value of water: Optimizing models for sustainable management, infrastructure planning, and conflict resolution." *Desalination and Water Treatment* 31, no. 1-3 (2011): 1-23.

Hands-on activity: Explore MYWAS interface

Lesson 3: Introduction to MYWAS approach and software

- Introduce the current context and allocation of water in Israel and Palestine
- Learn to use MYWAS, both to implement new scenarios and begin to interpret results
- What does “optimal” water allocation mean?

Hands-on activity: Learn to run MYWAS and evaluate results

Lesson 4: Possible field trip and/or further applications of MYWAS

- Explore additional scenarios in MYWAS
- Exploring tradeoffs and who wins or loses under different allocations
- What infrastructure would be built under different allocations

Hands-on work: Work on the preparation of the final report and presentation in small groups

Final day

- Students present final results of their MYWAS exploration
- Final thoughts and reflections from the week

Course reading list (additional readings will be assigned for course assignments):

Al-Sa'ed, R. (2010). A policy framework for transboundary wastewater issues along the Green Line, the Israeli–Palestinian border. *International Journal of Environmental Studies*, 67(6), 937–954.

<http://doi.org/10.1080/00207233.2010.528887>

Aliawi, A. (2009). Management and conflict aspects of waters between Palestine and Israel, 1(4), 88–97.

Corps, M. (2014). *TAPPED OUT : Water Scarcity and Refugee Pressures in Jordan*.

GTZ. (2008). *Water Resources in Jordan: National Water Master Plan*.

Lipchin, C. (2014). Transboundary Management of the Hebron/Besor Watershed in Israel and the Palestinian Authority. In G. H.-W. and T. S. Francesca de Châtel (Ed.), *Water Scarcity, Security and democracy: a Mediterranean Mosaic*. Global Water Partnership Mediterranean, Cornell University and the Atkinson Center for a Sustainable Future.

Meyhar, M., Bromberg, G., Khateeb, N. Al, Waxman, J., & Milner, M. (2014). *A Water and Energy Nexus as a Catalyst for Middle East Peace*.

Niezna, M. (2017). *Hand on the Switch: Who 's responsible for Gaza 's infrastructure crisis ?*

Rabbo, A. A., & Tal, A. (2008). *WATER WISDOM*.

Tal, A. (2006). Seeking Sustainability: Israel's Evolving Water Management Strategy. *Science*, 313(August), 1081–1084.

Tenne, A. (2010). *Sea Water Desalination in Israel : Planning , coping with difficulties , and economic aspects of long-term risks Author :*

- UNICEF, UN-UNICEF, & UN. (2012). *Gaza in 2020 A liveable Place?: A report by the United Nations Country Team in the occupied Palestinian territory. United Nations, Office of the United Nations Special Coordinator for the Middle East Peace Process (UNSCO)* (Vol. United Nat).
- Waslekar, S. (2011). *The Blue Peace: Rethinking Middle East Water*.
- Waslekar, S., & Futehally, I. (2013). *Water cooperation for a Secure World: Focus on the Middle East*.