Agricultural Water Demand

West Bank, Palestine

Eric Vaughan

Annette Huber-Lee **Timothy Griffin** **Richard Vogel**

WEP MoA PWA WSSS WATER: SYSTEMS, SCIENCE & SOCIETY Tufts

Water Economics Project (WEP)

Multi-disciplinary group of Israeli, Palestinian, Jordanian, Dutch and American researchers

Liquid Assets

- Water is a social and economic good
- Its value is bounded by the cost of desalination ($0.50 - $0.60)*
- Its value will be different in different locations
- **Water disputes need not be a zero-sum game**

Water Allocation Model (WAS)

Agricultural Sub-Model (AGSM)

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The Problem:

- Developing countries depend upon water resources to fuel the high level of economic growth necessary to reduce endemic poverty.
- Water scarcity can hinder or stagnate development
- Water Infrastructure is typically lacking or inadequate and water policies can be ineffective.

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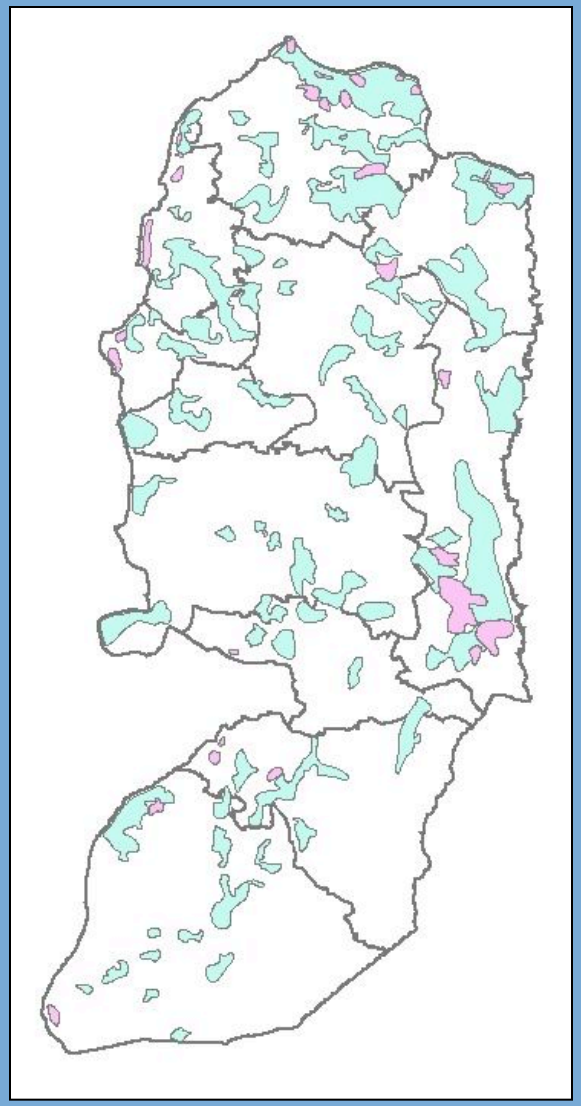
Agriculture in the West Bank



* Courtesy of PWA

- Irrigation Water accounts for 70% of total water use.
- 50% of farms are less than 1 hectare.
- Lack of infrastructure combined with disparate agricultural conditions (such as water price).
- The agricultural sector is highly constrained, mostly by water

  1,250 MCM in Israel
  155 MCM/yr in Palestine

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The Goal:

Evaluate the effects of a changing climate, shifting demographics and volatile market conditions on agricultural water use in Palestine

Multi-Year AGSM

Determines the optimal net benefits from agriculture based upon the profitability of crops and regional land, water and growth constraints.

Can guide water and agricultural policy decisions by estimating irrigation water use under various water pricing schemes.

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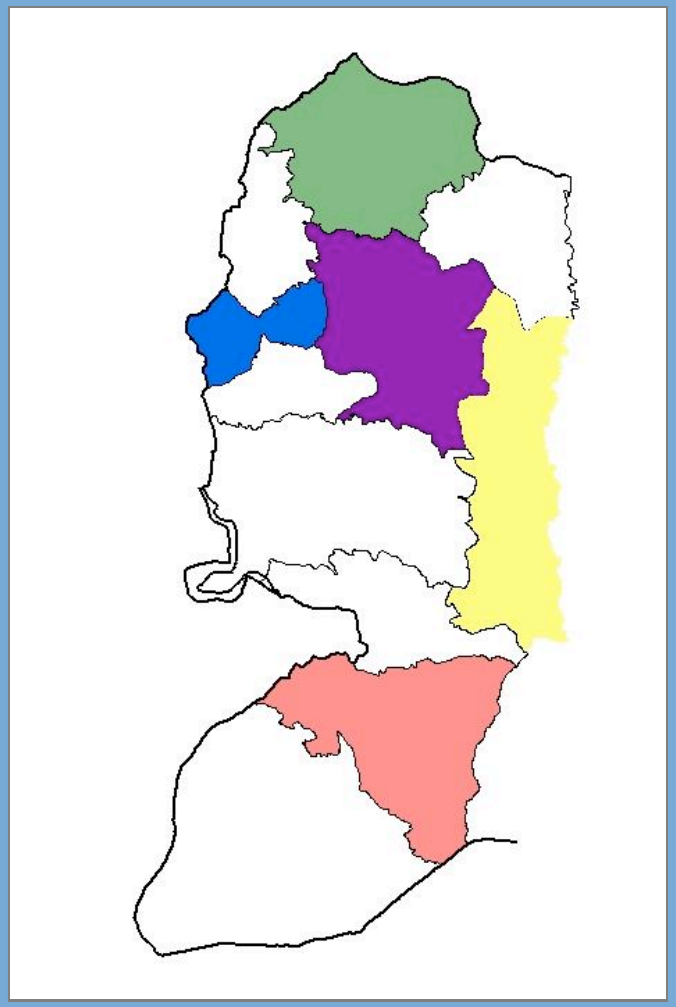
Data Collection for West Bank AGSM

- Focused on 5 Representative Districts



- **Jenin**
- **Nablus**
- **Qalqiliya**
- **Jericho**
- **Bethlehem**

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Went to the Source…

- Discussed water supply data and regional water strategies with the Palestinian Water Authority.
- Met with Extension Agents and Farmers through the Ministry of Agriculture **in each district**.
- Received **detailed** cost **estimates**:
  - Water, land, labor, fertilizer, pesticide, maintenance, seed, fixed costs, transportation, and equipment.
- Received **farm-gate** price estimates from multiple sources.
- Received **typical** water pricing for wells and springs.
- In Total: **3,504 data points!**

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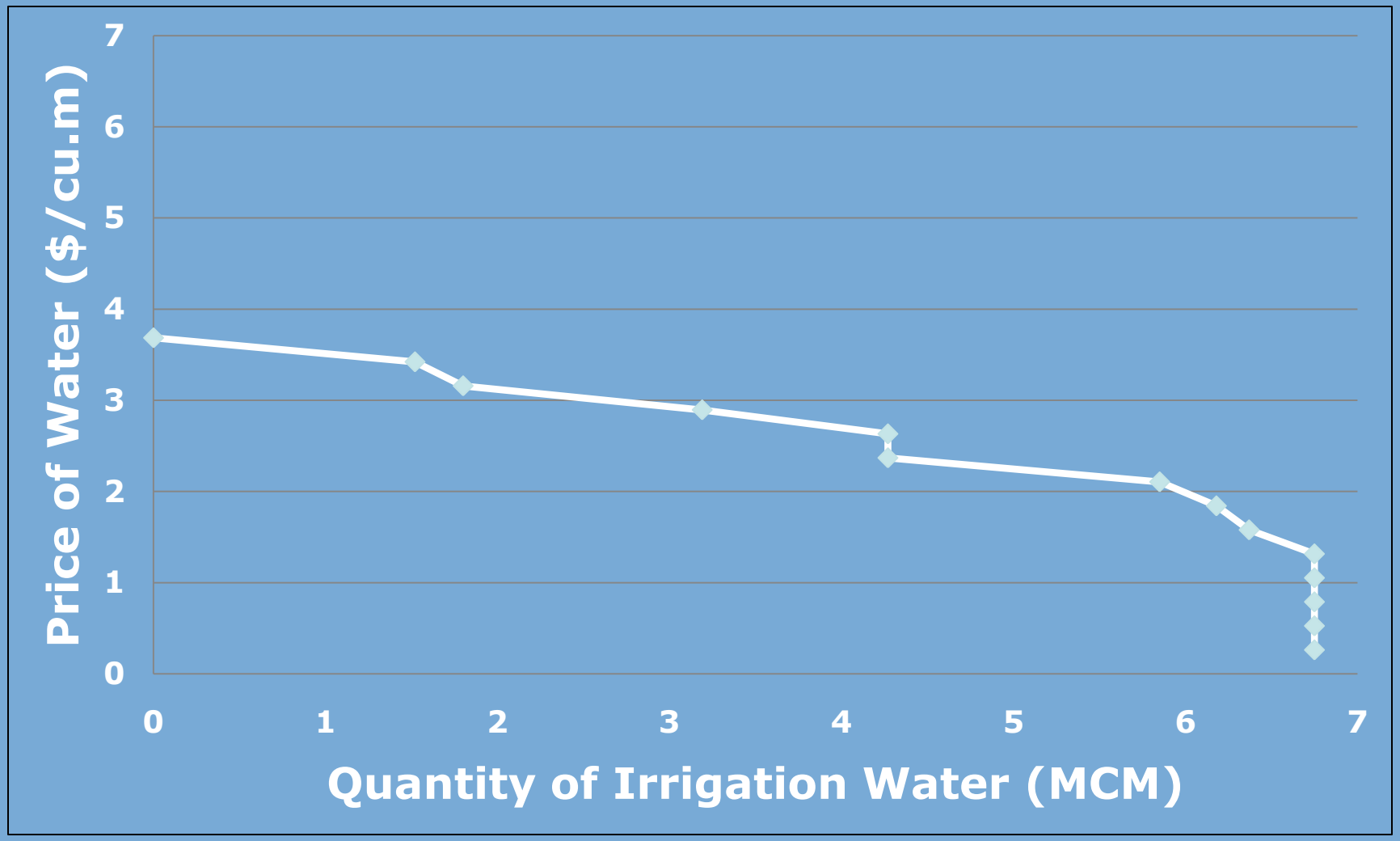
Initial Demand Curve, Jenin



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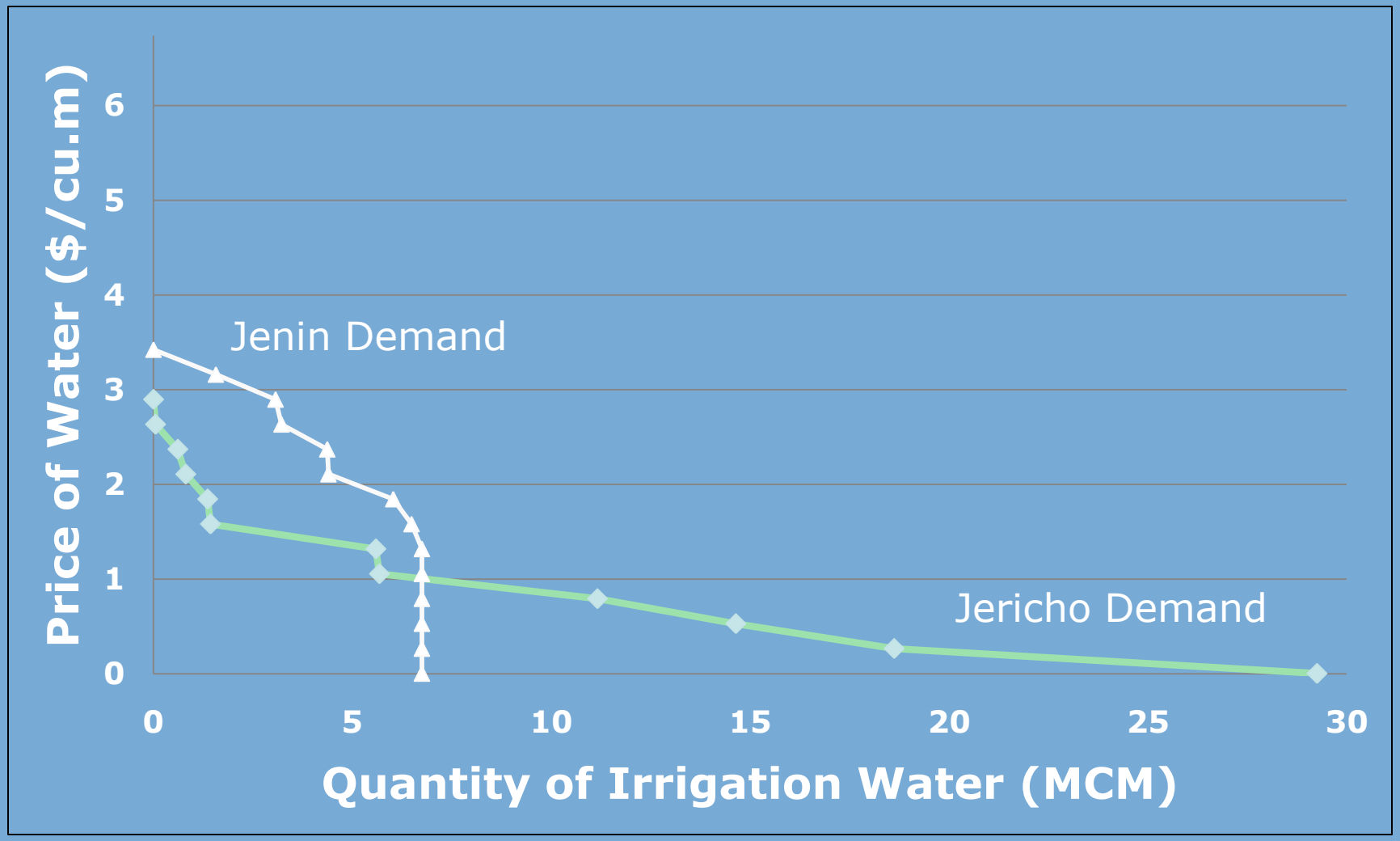
Jenin and Jericho Comparison



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Future Water Supply Scenarios

- With theoretical changes in future water capacity, **competition from other types of demand and the impact of climate change multi-year AGSM can help identify**:
  - Where future water is most valuable
  - Which crops are best based per quality of water
  - Optimal Net Benefits of Agricultural expansion from future water availability

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Questions?

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