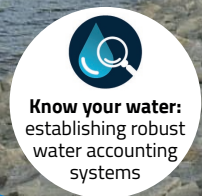




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RAPID WATER ACCOUNTING

Al-Mashare' Jordan

Water accounting is the systematic quantitative assessment of the status and trends in water supply, demand, distribution, accessibility and use in specified domains, producing information that informs water science, management and governance to support sustainable development outcomes for society and the environment (FAO, 2012, 2016).



STUDY AREA

WHERE IS THE SITE?

Al-Mashare' study area is located in the northern Jordan Valley (JV) and includes the development zones (DZ) 13 and 14 and also the catchment of Wadi Rod Um Eldeib, where water harvesting structure is planned to be built.

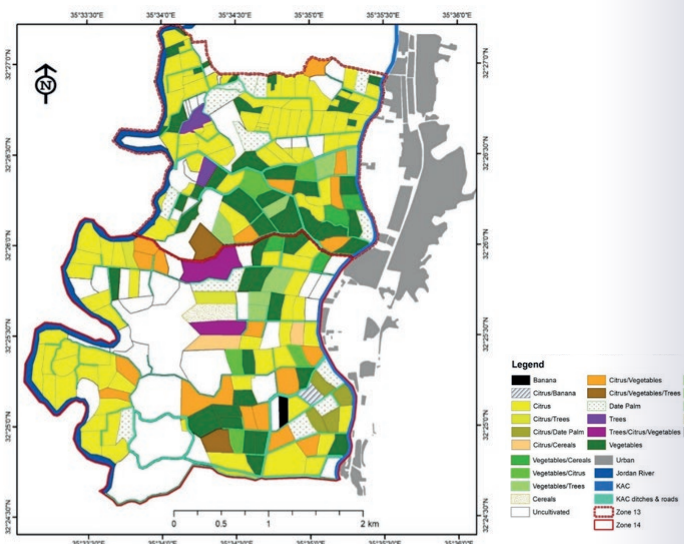
CONTEXT

- Climate:** Mediterranean semi-arid (308 mm/yr rain).
- Crops:** Citrus, vegetables, date palm, and fruits. Some rainfed cereals in the Wadi Rod Um Eldeib catchment.
- Growing Season for annual crops:** Oct-Jan and Feb-May (double cropping).
- Water Sources:** Surface water mixed from treated waste water delivered by the King Abdullah Canal (KAC), and small amount of ground water from a well that was licensed a long time ago.



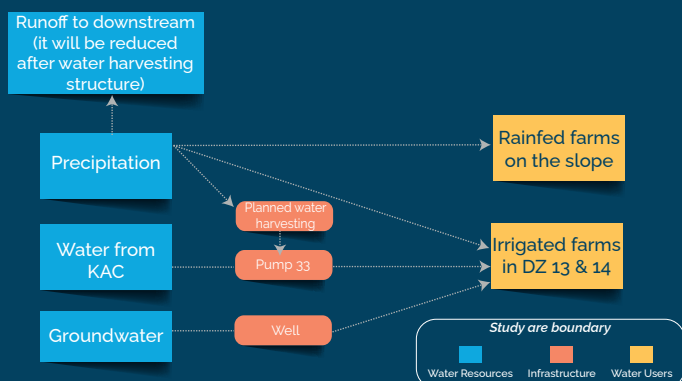
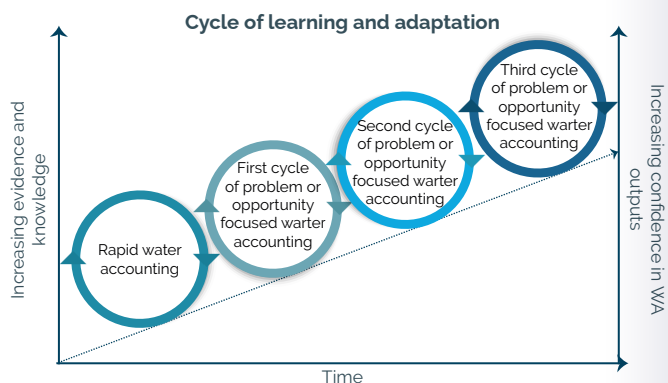
KEY QUESTIONS

- How much is the supply-demand gap?
- How much water is available?
- How much water can be harvested in Wadi Rod Um Eldeib?
- Where are the critical uncertainties on the above?



Source: Jawad Al-Bakri, [2019].

Rapid Water Accounting (RWA) is a simple water accounting (WA) that primarily uses existing data, rather than collecting new data and developing new models. RWA is recommended for the first cycle of water accounting.



METHOD

SUPPLY

- **Water supply** from pump station (connected to King Abdallah Canal).
- **Precipitation** data from nearby weather station (308mm/yr).
- **Runoff from side wadis on Jordan valley:** estimated runoff coefficient of 5.7 percent (from studies conducted for other catchments).

RESULTS

AGRICULTURAL WATER USE, DEMAND, AND SUPPLY

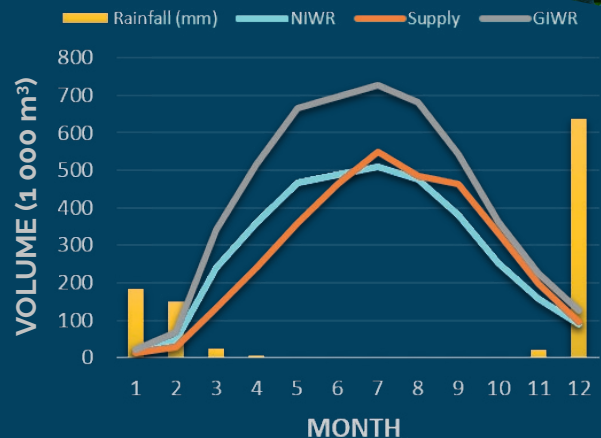
- Among various crops, date palm and banana have high irrigation requirements. Citrus has medium irrigation requirement.
- Supply-demand gap exists throughout the year since GIWR >> Supply.
- The calculated gap has uncertainty since irrigation efficiency of the study area comes from an assumption.
- The sources of uncertainties/insufficiency of data comes from:
 - Assumed irrigation efficiency;
 - Lack of daily radiation data at the nearest station;
 - Lack of ETa measurement or net water consumption.

WATER HARVESTING (CATCHMENT OF WADI ROD UM ELDEIB)

- In an average year, '100 000 m³ of water can be collected.
- The quantity helps reduce the gap and can reduce salinity of the water supplied in winter, when the water supply in the study area tends to have high salinity.
- Uncertainties/insufficiency of data come from:
 - Lack of runoff coefficient from the study area;
 - Silting may reduce reservoir capacity.

DEMAND

- **Water demand** is mainly for agriculture.
- **ETc = ET_o x K_c.** Crop coefficient (estimated in other areas in Jordan Valley).
- **Net and Gross Irrigation Water Requirement (NIWR and GIWR)** (calculated).
- **Irrigation efficiency** of 0.7 (assumed).



	Total (dunum)	Crop (%)	Annual ETc (mm)
Banana	29	0.5	1 267
Citrus-mature	3 100	46.7	601
Citrus-new plantation	1 659	25.0	180
Date palm	526	7.9	1 055
Cereals	74	1.1	225
Fruit trees	151	2.3	665
Vegetables (one-two seasons)	1 089	16.4	588

NEXT ROUND OF WATER ACCOUNTING (WA)

- Measure the consumption = actual evapotranspiration and radiation for different crops (use the CORDOVA ETa station).
- Measurement the efficiency of irrigation → measurement of water application and ETa.
- Expansion of study area to a larger part of the Jordan Valley.
- Use of satellite-based ETa as the area becomes larger.

This activity is under the regional project "Implementing the 2030 Agenda for water efficiency/productivity and water sustainability in NENA countries" under the Water Scarcity Initiative. This project is implemented by the Food and Agriculture Organization of the United Nations and funded by the Swedish International Development Cooperation Agency (SIDA).

Food and Agriculture Organization of the United Nations
Regional Office for the Near East and North Africa
www.fao.org/neareast
RNE-WEPS-NENA@fao.org



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