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# Country Pilot Improved Water Allocation for Agriculture

(Palestine)

03-10-2022



# 1 Country background

## General

Historical Palestine area : 27,000 km<sup>2</sup>

- West Bank area: 5845 km<sup>2</sup>
- Gaza Strip area: 365 km<sup>2</sup>

The climate of Palestine: a desert and semi-humid climate



# 1 Country background

## Available Water Resources in Palestine

### Rainwater

- the main source of water, as it feeds the aquifer, waterways, valleys, and torrents
- falls in winter and spring months,
- Its amount is limited and fluctuating, with an average annual 460 mm in West Bank, 356 mm in Gaza Strip

### Groundwater

- Three groundwater basins (Western, Eastern and Northeastern) represent the groundwater aquifer system in the West Bank.
- Part of Coastal Aquifer exists in Gaza Strip. GW represents 95% of Palestinian water supply.

### Surface Water (Jordan River, flood Wadis)

- No Access, No use of the Jordan River and Dead Sea water.
1. Few water harvesting attempts due to occupation restrictions, lack of experience, lack of finance, and high cost



# 1 Country background

## Non Conventional Water Resources

### Rainwater Harvesting:

- small scale projects Dams and agricultural ponds to be used in irrigation
- Roof top water harvesting cistern to be used in municipal uses.

### Treated Wastewater for Reuse in irrigation

- about 1500 m<sup>3</sup>/day from Jenin wastewater Treatment Plant , 500 m<sup>3</sup>/day from Jericho treatment plant and 500 m<sup>3</sup>/day from small scale treatment Plants In West Bank
- about 4MCM is reused in irrigating agriculture In Gaza

### Desalination

- about 3.9 MCM is used for drinking purposes in Gaza
- Pilot projects in West Bank to desalinate brackish water in Jordan Valley.

**Purchased water** from Israeli Mekorot Company.....94.9MCM/Y in 2020 with price of 0.75-0.85 \$ / m<sup>3</sup>

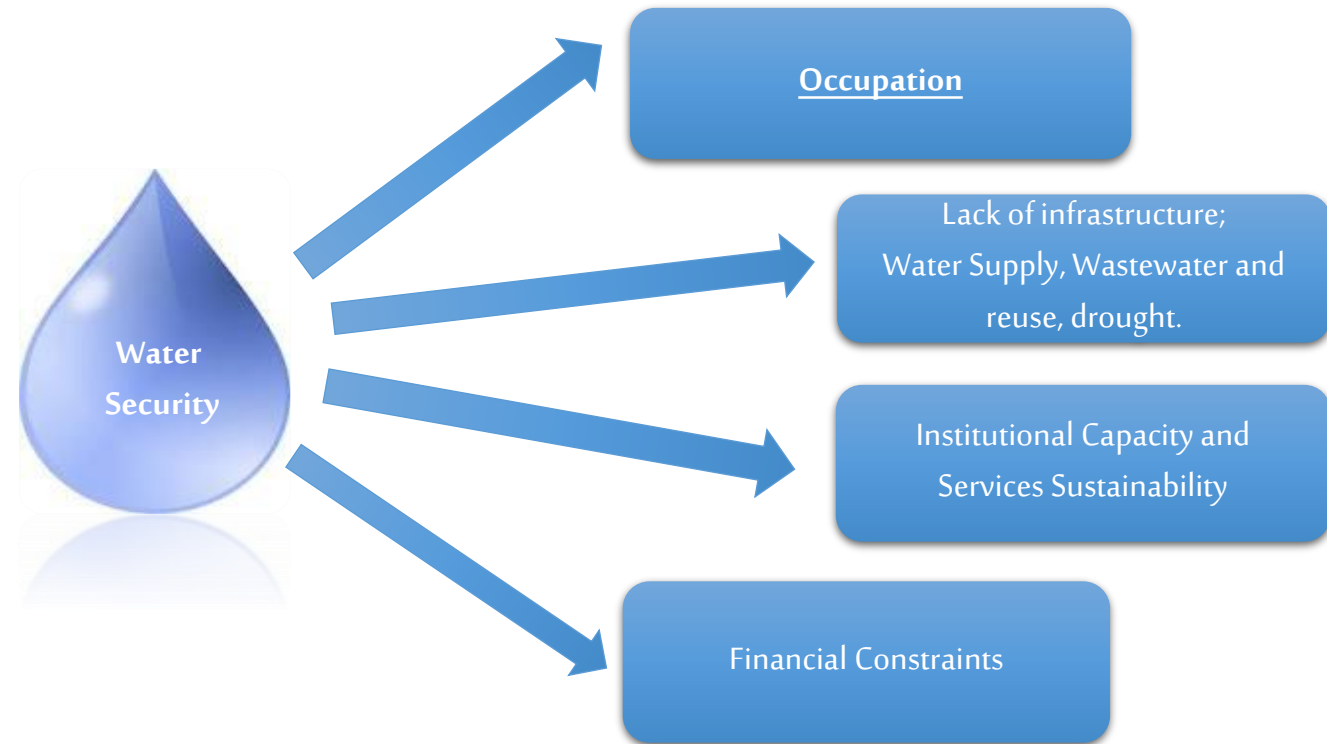
- 77.5 MCM/y for West Bank (represents 62 % of domestic water )
- 4.2 MCM/y for Agriculture in West Bank
- 13.2 MCMC/y for Gaza Strip (represents 46% of suitable drinking water)

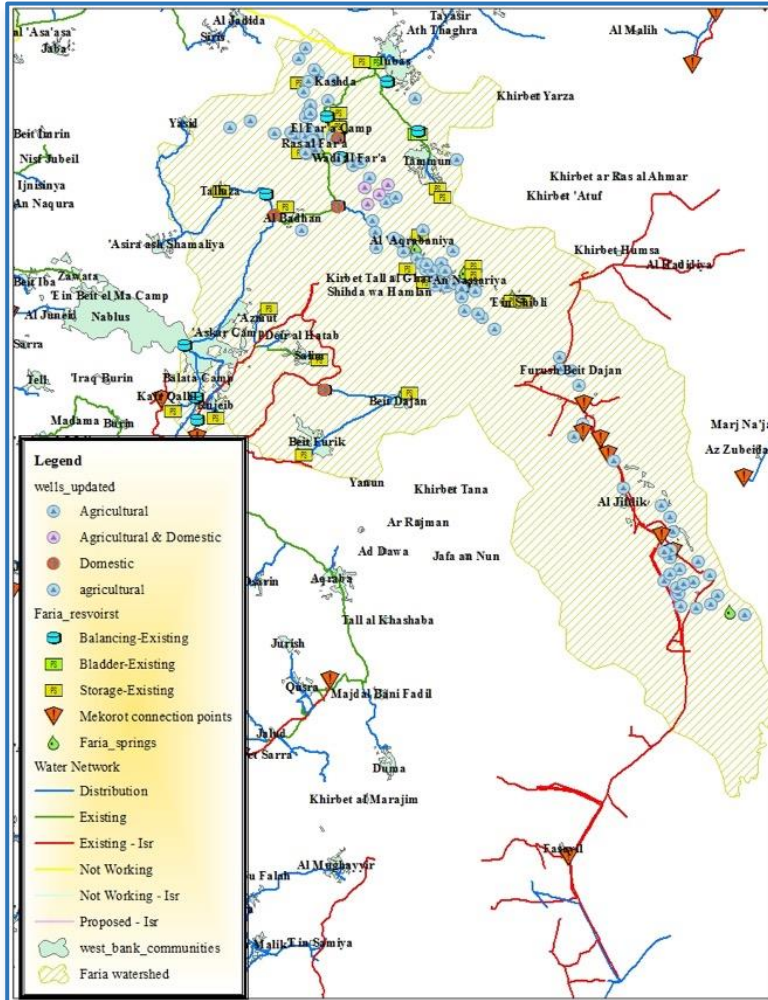


## 2 Country challenges

### Main Challenges of Water Security

- Demand e exceeds the available water supply
- Large construction needs in water supply infrastructure.
- Agriculture accounts for about 40% of total conventional water supply.
- Water Salinity in Gaza and Jordan Rift Valley.
- Climate change
- Desertification due to loosing 50% of the grazing areas to Israeli settlements and military camps and “nature reserves”.
- Excessive pumping
- Water resource access is fragmented; inequitable access and availability.
- Water users associations are very important institutional partners in water management. Up to date their efficient rule is not fulfilled.
- lack of official lawmaking power
- The need to endorse and implement Water Management bylaws and regulations agricultural water tariff , etc.





# 3 Proposed pilot area (1)

## Al Fara'a Watershed as a case study

Why Al Fara'a???

Rapid Water Accounting and Governance was conducted

- Data was collected
- Water issues and problems were identified

Significant change in agriculture development since the last twenty years.

- It shifted from a primarily rainfed, cereals and legumes oriented to an irrigated export-oriented horticulture production zone

Inequities in water access and allocation

Legal pluralism in water tenure and institutional fragmentation in water domain

## 4

# Proposed pilot area (2)

| Category              | Demand (MCM)              | Supply (MCM) | Gap (MCM) |
|-----------------------|---------------------------|--------------|-----------|
| Irrigated agriculture | 24,973,689 <sup>(1)</sup> | 23,069,870   | 1,903,819 |
| Municipality          | 1,890,400 <sup>(2)</sup>  | 1,730,922    | 159,476   |
| Total                 | 24,960,270                | 26,704,611   | 2,063,295 |

## Main Stakeholders

- MoA, PWA, MoLG, EQA, Governance of Nablus & Tubas
- Farmers association & cooperatives
- wells owners)
- Investors
- Spring Water rights owners

| Inflows                                               | Source of data     | Quantity (m <sup>3</sup> ) |
|-------------------------------------------------------|--------------------|----------------------------|
| Precipitation                                         | PMD & PWA database | 67,158,000                 |
| Import (Purchased water)                              | PWA database       | 450,000                    |
| Groundwater lateral flow (in)                         | Study results      | 4,000,000                  |
| Wastewater flows into the area                        | PWA database       | 4,500,000                  |
| <b>Total inflows</b>                                  |                    | <b>76,108,000</b>          |
| Outflows                                              | Source of data     | Quantity (m <sup>3</sup> ) |
| Runoff from precipitation, exiting the study area     | PWA database       | 6,760,000                  |
| Wastewater and/or TWW passing to the Jordan River     | estimations        | 1,000,000                  |
| Actual Evapotranspiration from agriculture            | estimations        | 57,400,000                 |
| Actual Evapotranspiration from non-agricultural lands | N/A                | N/A                        |
| Water Export                                          | PWA database       | 9,125,826                  |
| Groundwater lateral flow (out)                        | N/A                | N/A                        |
| <b>Total outflows</b>                                 |                    | <b>74,285,826</b>          |
| <b>Change In Storage</b>                              |                    | <b>1,822,174</b>           |

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## What the pilot want to achieve?

To learn how to go for other areas in the country: scaling up!



# 6

## Proposed activities (indicative) and time lines



## Stakeholder Participation

Prepare a communication plan:

1. Map all stakeholders
2. Bring together the various stakeholders so that they know each other and appreciate different positions
3. Identify and discuss the different interests and positions
4. Create common perception preferably by maps/data and role playing game
5. Create structured process with delegated subgroups
6. Create a communication mechanism suitable for the region to continue outreach and ensure continuous participation
7. Make use of local activists/ leaders

| A                                          | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | C | D | E | F | G | H | I |  |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|--|
| Improved water allocation preparation plan | <p>Preliminary Assessment of Urgent Water Allocations Performances and Identifying Improvements for the following issues. Assessment will be done through stakeholders participation</p> <ol style="list-style-type: none"><li>1. Water allocation for improved productivity</li><li>2. Improved management of drought and abundance</li><li>3. Drainage water reuse and water quality management</li><li>4. Balanced management of surface water and groundwater</li><li>5. Substitution of water resources</li><li>6. Optimizing irrigation schedules and supplies</li><li>7. Improved demand orientation</li><li>8. Improved multifunctionality</li><li>9. Equity measures and protection of vulnerable people</li></ol> |   |   |   |   |   |   |   |  |
|                                            | Define what would be need to be done to explore and set in motion based on the conducted assesment (all possible measures for demand and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |   |   |   |   |   |   |  |



| A | B                                                                                                                                                                                                                                                                                             | C | D | E | F | G | H | I | J |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|
|   | Collect available data like: Official water allocations when they exist, Actual water consumption, Actual production (in biomass), Soil moisture and water stress, Water productivity, Weather effects, Trends over time in the above, Impact in terms of social water productivity , ...etc. |   |   |   |   |   |   |   |   |
| 5 | Compile existing studies and available data                                                                                                                                                                                                                                                   |   |   |   |   |   |   |   |   |
| 6 | Review Water Accounting Study for the pilot area                                                                                                                                                                                                                                              |   |   |   |   |   |   |   |   |
| 7 | Review Water Governance study for the pilot area                                                                                                                                                                                                                                              |   |   |   |   |   |   |   |   |
| 8 | Supporting studies<br>Suggest the required studies for the pilot area (The water distribution system, hydraulic structures, rotations, cropping pattern, administrative system, agricultural and non-agricultural water needs, water user associations and water councils if any... etc.      |   |   |   |   |   |   |   |   |
| 9 | Prepare a descriptive report for the study area which presents the available studies and data and the required but not available studies and data                                                                                                                                             |   |   |   |   |   |   |   |   |
| 0 | Identify training needs and data collection activities to be carried out in                                                                                                                                                                                                                   |   |   |   |   |   |   |   |   |





# Thank You

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