CIHEAM
BARI

Water scarcity and Agriculture

The case study of Ostuni territory

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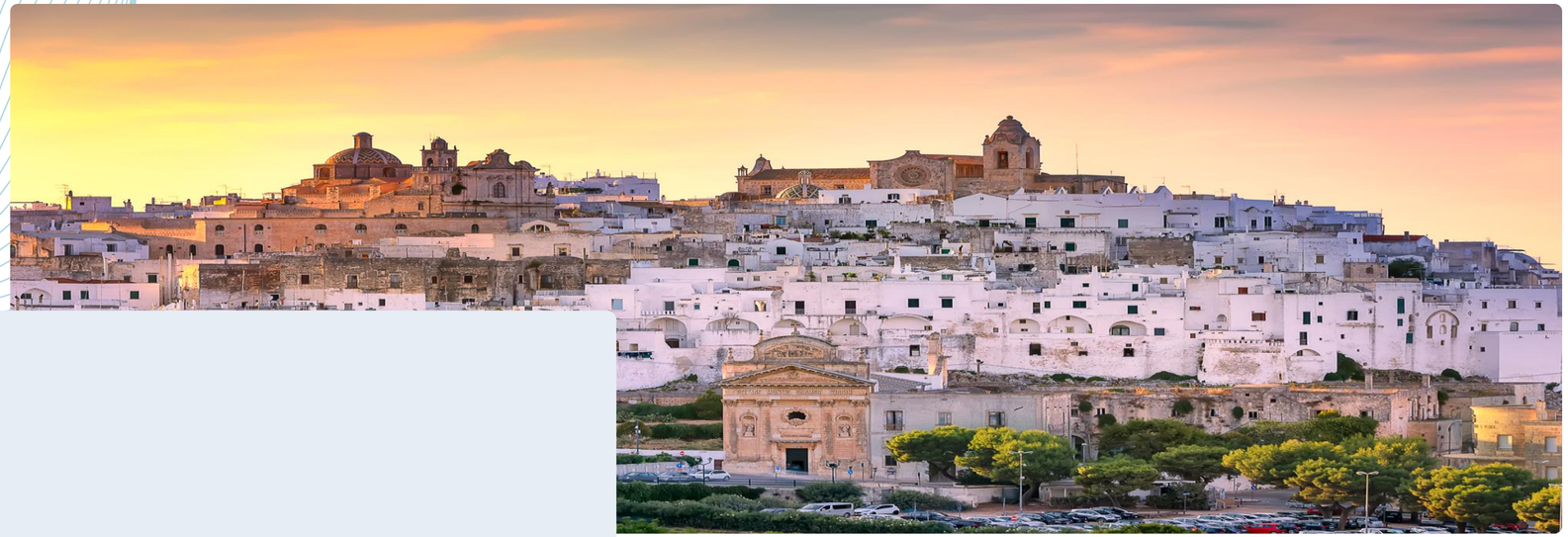
Introduction

Agriculture consumes 70% of global freshwater withdrawals, need an additional 1 trillion m^3/ year by 2025 to meet food demands (FAO, 2021).

Climate change intensifies droughts and disrupts water cycles, threatening food security and economic stability (FAO, 2023).

Faces increasing competition for water resources between agricultural needs and the demands of its growing tourism sector.



Ostuni territory

Hilltop in the province of Brindisi, Apulia, southern Italy, Perched on three hills at the edge of the Murge plateau, offering panoramic views of olive groves and the Adriatic Sea.

Climate

Mediterranean climate: hot, dry summers and mild, wet winters;

summer temperatures 30°C with very little rainfall.

Agriculture

Olive cultivation, featuring ancient monumental olive trees : central to the local economy and cultural heritage.

Objective

Present situation

Describe the current water scarcity situation in Ostuni, highlighting hydrological and infrastructural assets.

Main actors

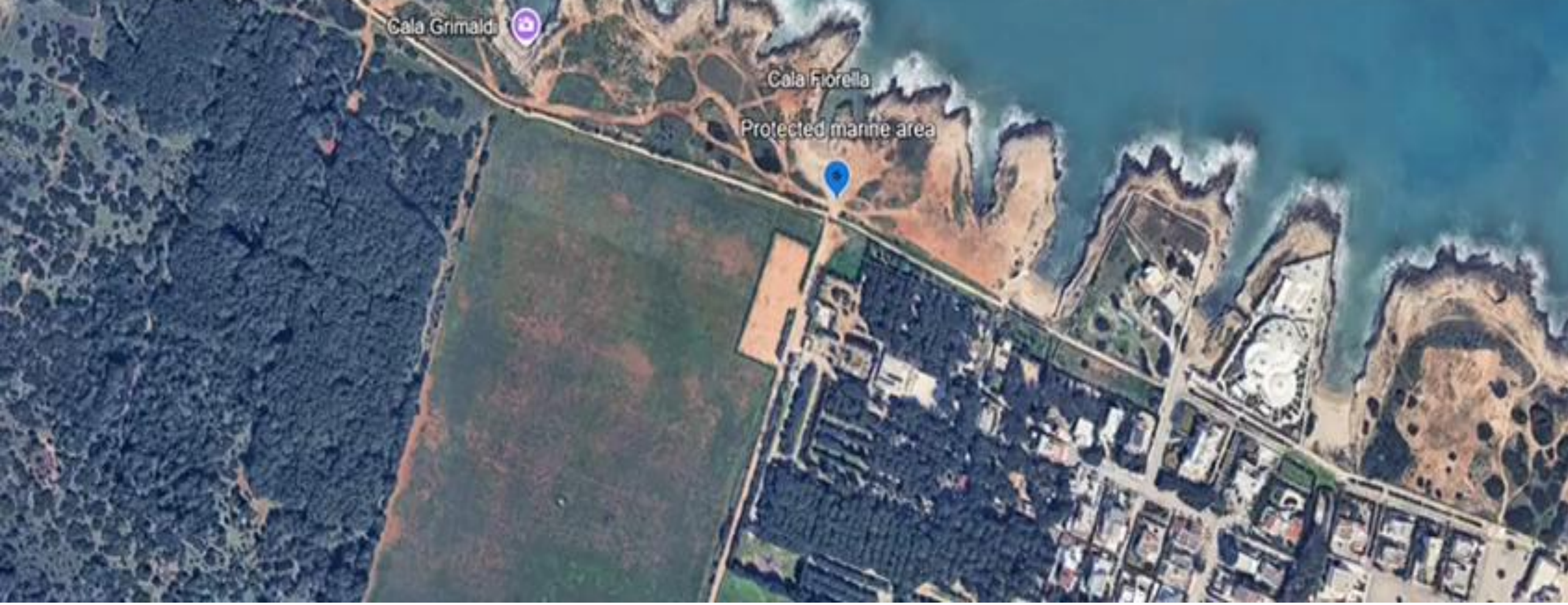
Identify the main actors involved in water management

Impacts

Analyze the impacts of water scarcity on agriculture

Solutions

Recommend sustainable solutions focusing on improving water management and infrastructure



Methodology

The study was conducted along a transect comprising 8 distinct locations.

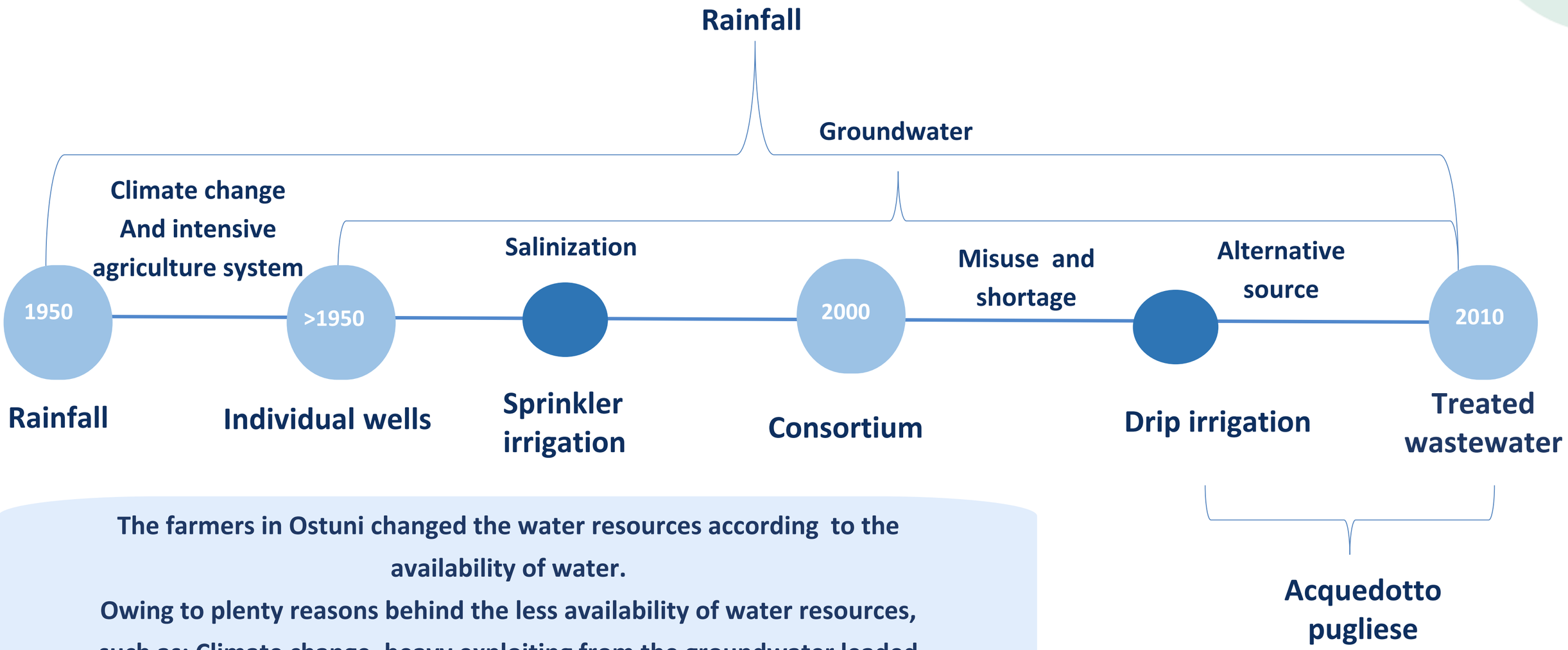
Methods (visit, interview and discussion)

Group meeting, team work and presentations

Seminars and interview with experts

Transect in the territory, interview and discussion with stakeholders

Water resources evolution over years



The farmers in Ostuni changed the water resources according to the availability of water.

Owing to plenty reasons behind the less availability of water resources, such as: Climate change, heavy exploiting from the groundwater leaded to the intrusion of sea water caused the salinity problem.

Individual wells

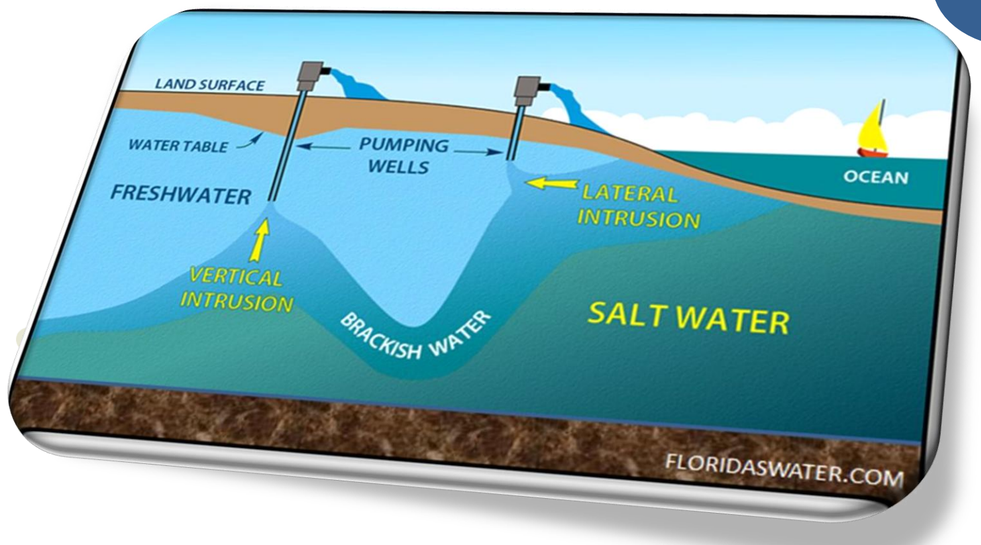
80%

of farmers use their own wells.

The main challenge is the continuous digging and exploitation of wells and the increasing salinity of groundwater.

Many wells are now can not be used due to high salinity

Illegal private wells operate in the area, selling water at inflated prices.



- ❖ Farmers may pay a one-time fee for access to:
- Private distribution networks.
- Groundwater from privately owned wells.
- ❖ The coastal farmers are experiencing seawater intrusion

Consorzio Di Bonifica Centro Sud Puglia

- Created in 2000 to manage groundwater distribution to farmers in Ostuni.
- Governed by an association of farmers mainly to ensure a cooperative approach to water management.
- Operates five wells (200 m deep) that pump groundwater into a central tank using electric energy.

- Currently supplies water to 100 farmers, covering 200 ha of farmland.
- Price of water fluctuate depending on the on energy costs (was previously 0.90 per m^3 but now is €0.50 per m^3).
- Plan to expand up to 400 hectares.

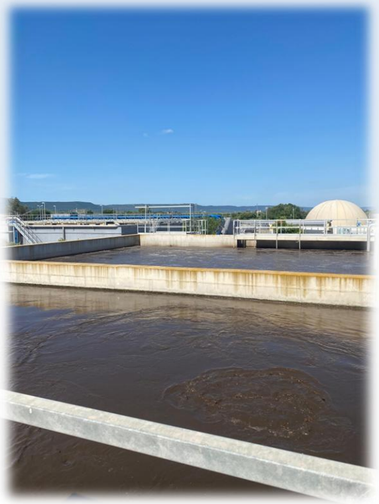
Wastewater Treatment Plant

Overview

- Built and managed by the Aquadotto pulgiese.
- The distribution managed by the municipality.
- It is funded by EU.
- Processes 4,000 m^3 of wastewater daily
- Treatment capacity for 65,000 inhabitants.
- Two 12-hour shifts staffed by six workers; treated water is discharged into the sea.
- The farmer pays to Aquadotto pulgiese, while the citizens pays to municipality.

Water for irrigation

- Supplied to local farmers from May to October for irrigation.
- irrigates 150 hectares of farmland, generating revenue of €0.50 per cubic meter supplied to local farmers..



Challenges

- Huge potential but limited infrastructure (reservoirs, Distribution network)
- 11% of treated wastewater is only reused in Ostuni.
- Reuse of the byproducts.

Main Water users (Agriculture)

Farmers

- **Luciano Martucci: 85-year-old (Farm size: 72 ha)**
- grows both ancient and newer olive varieties (Coretina, Leccino)
- Has his own mill for production and olive oil brand.
- **Water access**: was using wells but now relies on treated wastewater for irrigation.
- **Challenges**: sea water intrusion,
- **Solution**: Adopted surface ploughing to improve soil water retention.

- **Corrado (Masseria Brancati): (Farm size: 32 ha)**
- Agritourism & ancient olive grove conservation
- **Water access**: relies on well from another plot.
- do minimum tillage to break soil capillarity and maintains ground grass To reduce evapotranspiration.

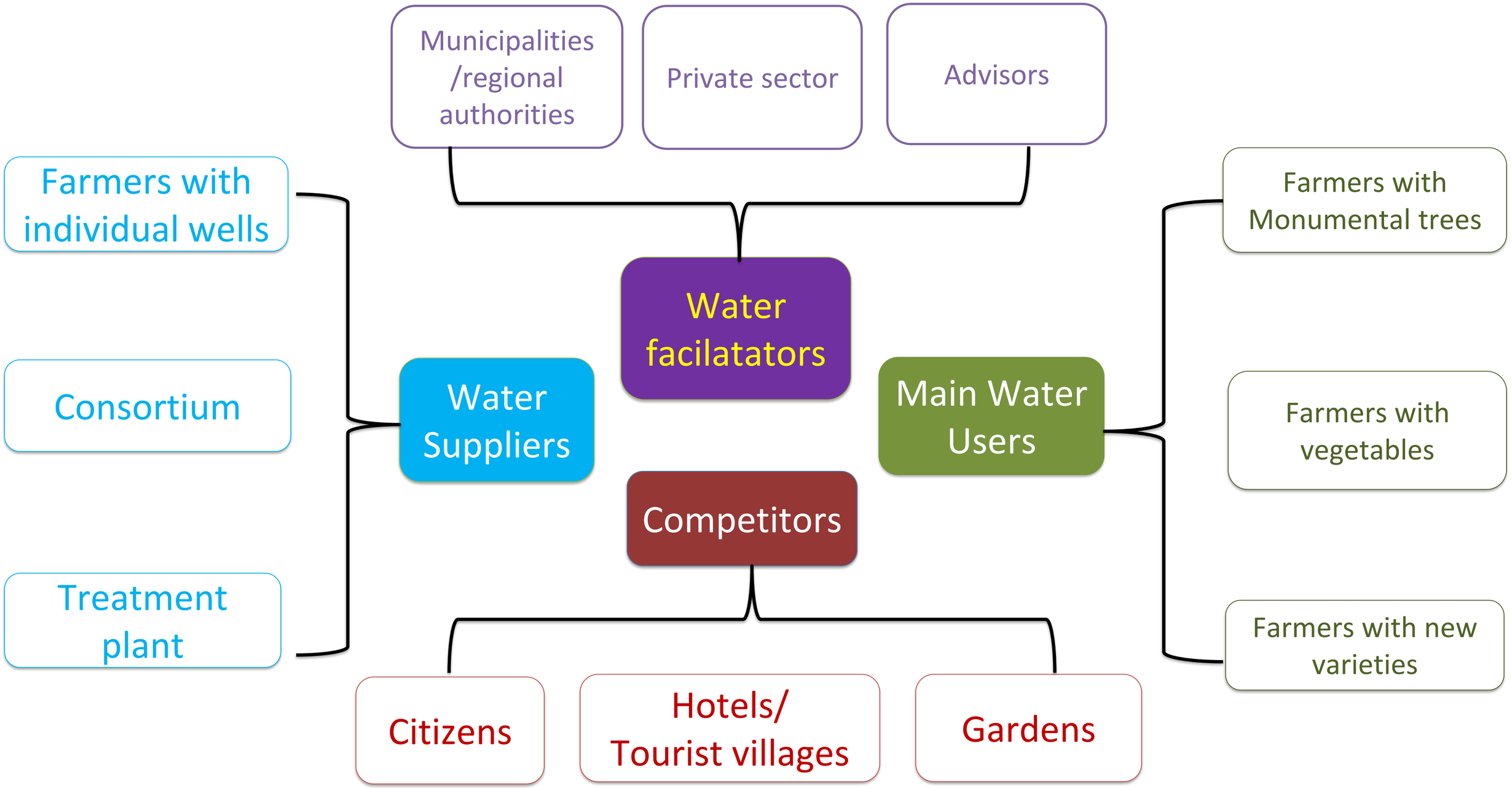
- **Antonio Barletta : (Farm size: 7 ha)**
- Cultivates both ancient, monumental olive trees and newer varieties like Coratina and Leccino.
- Practicing crop diversification by introducing watermelon to generate income (high water demand).
- **Water access**: relies on treated wastewater,
- Switch from sprinkler irrigation to drip irrigation to increase water efficiency.

Other Water Users (Competitors)

Other sectors that significantly contribute to water scarcity by competing for water with agriculture especially during summer period include :

- Restaurants/hotels
- Villages
- Industrial sector
- Households

Actors Involved in Access to Water



Water Challenges in Ostuni

Climate Change Effects

- Unpredictable rainfall, longer droughts
- Higher temperatures → ETP → less groundwater recharge

Groundwater Depletion & Salinization

- Over-pumping → seawater intrusion
- Salty wells → infertile soil → lower farm yields

Xylella Fastidiosa Impact

- Kills ancient drought-resistant olive trees
- Forces farmers to plant higher demanding crops → more water needed
- Less tree cover → hotter soil → less water retention

Water Challenges in Ostuni

Water Distribution and Infrastructure Issues

- Only 11% of treated wastewater is reused
- Illegal wells, unfair access, energy costs spike.
- Low coverage

Competition Between Sectors

- Agriculture (60% water use) clashes with tourism (pools, gardens, peak summer demand).
- Political action needed: Who gets priority, food or hotels?

Governance and Management Issues

- Infrastructure investment: Modern pipelines/storage to distribute water fairly.
- Expand wastewater treatment: Current capacity (4,000 m^3/day) underused.

Conclusion

- Water is major issue for Ostuni territory.
- Different reasons forced farmers to change the extensive rain-fed agriculture to intensive high water demanding one.
- Farmers struggle with accessing water for their crops due to climate change, limited rainfall, excessive water use, salinization, disease and lack of alternative sources.

Impacting agricultural practices and crop yields

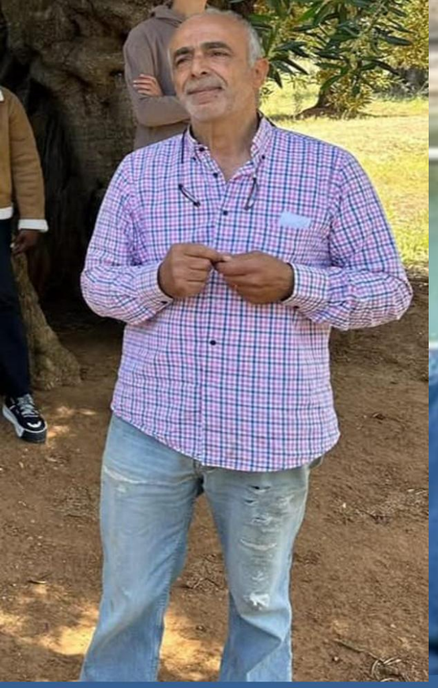
Actions have been taken but not fully solve the problem (Consortium, Treatment plant, etc.).

Action Taken & Future Directions

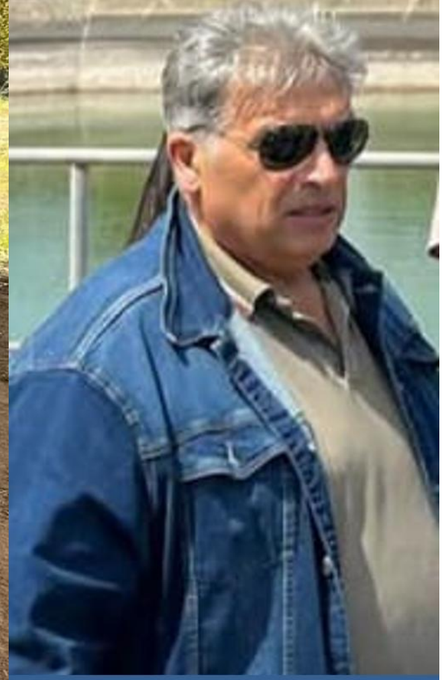
- Invest in expanding the distribution networks and storage basins.
- Expand area coverage.
- Prioritizing water supply.
- Implement permanent land cover and shredded pruning residues.

Recommendations

- Strengthen water governance frameworks.
- Enhance stakeholder collaboration.
- Develop alternative water sources.
- Find a possible ways to use sludge from treatment plant.
- Regulate types of crop diversification.



Corrado Brancati



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THANK YOU FOR BEING PART OF THIS WORK!!

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