

Using Treated Wastewater for Agriculture in Tunisia

Farmers' and Consumers' Perspectives

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Problem Statement

- **Low expected water availability** by 2030: < 350 m³/year/capita (absolute water scarcity: 500 m³/year/capita)
- **Agricultural irrigation** accounts for **more than 80% of total water consumption**
- **Long history of wastewater reclamation**, yet **reuse in agriculture still very low** (< 7% of treated wastewater)

Research Objectives

- Understanding **farmers' perception and willingness** to reuse **treated wastewater (TWW)** for irrigation
- Understanding **consumers' acceptance** to purchase food crops produced with TWW
- Exploring **favourable conditions** to increase acceptance on farmer and consumer level

Research Questions

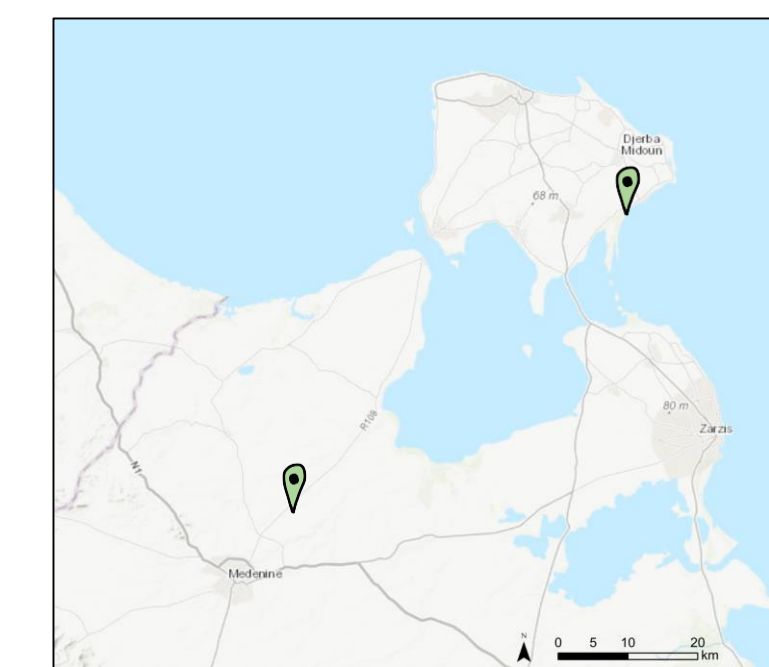
- What are **institutional, social, economic, and governance drivers** pertinent for farmers' perceptions of TWW reuse?
- What **factors affect consumers' acceptance** of food crops irrigated with TWW?

Empirical Approach

- 1 Extensive literature review
- 2 12 semi-structured interviews at national and local levels
- 3 Focus group with more than 22 participants
- 4 Consumer survey at local weekly food markets (n=100)

Study location

Island of Djerba and Medenine

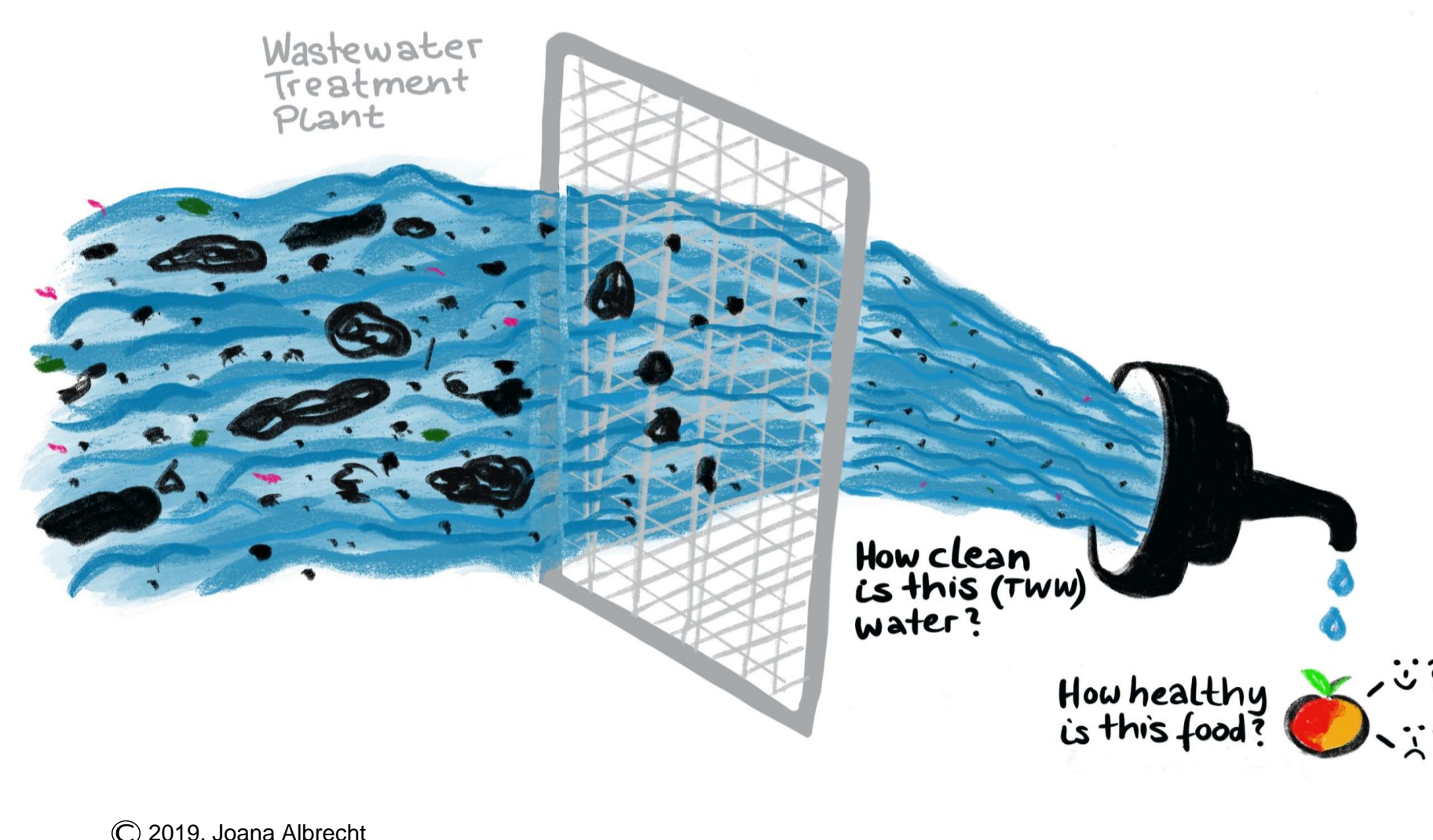


Results

Factors influencing farmers' perception and willingness



- **Institutional and coordination deficits** due to multiple involved administrations and unclear working rules
- **Technical inefficiency of treatment plants** leads to poor TWW quality and high contamination risk
- **Low trust in treatment plant operators**
- **Low economic incentives** because of irrigation restrictions for cash crops
- **Lack of awareness of benefits**
- **Perception of health risks**



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Factors influencing consumers' acceptance



- **Mainly disgust & perceived health risks**
- **Low level of knowledge** on TWW irrigation
- **Over 20% living near treatment plant**
 - Most claim **land degradation** due to effluents out of control
 - **Against irrigation with TWW**
 - **Distrust towards plant operators and authorities monitoring plants**
- **30% would not object irrigation with TWW if safety was guaranteed**
- Yet, **no efforts** made by authorities to inform public about health risks

Conclusions

Farmers' level:

- TWW-related sectors involve **many actors with different perceptions and incentives** → **complex governance**
- **Ineffective coordination and exchange of data** between authorities
- **Poor technical efficiency of treatment plants** as source of insecurity
- **Economic uncertainty** as result of technical and coordination impediments and restriction for cash crop
- **Social, cultural, and religious aspects** are of **secondary relevance** for farmers' decision

Consumers' level:

- **High resistance** to products irrigated with TWW
- **Perception of health risks causes insecurity**
- **Low trust** in operators of treatment plants and authorities monitoring plants

Difference between perceptions of TWW:

- **Farmers' attitude** is driven by **freshwater scarcity** and need for alternatives
- **Consumers** show **high level of awareness, perception of health risks, and insecurity about product quality**

Policy Recommendations

- ✓ **Ensuring transparent and reliable communication of environmental, health, and economic aspects** to improve farmers' and consumers' perceptions of TWW
- ✓ **Involving the public and farmers in planning, implementation, and monitoring of TWW reuse projects** to increase trust in plant operators and monitoring authorities
- ✓ **Improving TWW quality and removing irrigation restrictions** to increase acceptance of TWW reuse by farmers
- ✓ **Better defining and allocating responsibilities in wastewater management between environmental, health, and agricultural authorities** to reduce conflicts, increase TWW reuse rates, and improve governance

