

CASE STUDY 11

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PALESTINE

Organization: Arab Agronomists Association (AAA)
Region: Europe, Middle East, North Africa (EMENA)

The Wadi Al Shami valley in Kefryat-Tulkarem, West Bank, encompasses crop-lands, grasslands, built-up areas, and short vegetation. Historically, smallholder farmers in the valley have cultivated olives, citrus, almonds, and diverse crops, sustaining over 6,000 residents. Following the Al-Aqsa Flood war in October 2023, many residents returned to farming as a critical survival strategy after losing formal employment, reaffirming the valley's role as a foundation for food security and livelihoods.

The territory faces multiple pressures. Industrial wastewater and untreated effluents from nearby factories have contaminated soils, reduced fertility, and contributed to biodiversity loss. Water scarcity is exacerbated by restrictive land policies in Area C, deep well extraction by nearby Israeli settlements, and the presence of the Separation Wall, which diverts groundwater from Palestinian wells. Settlement expansion and strict permit regimes further restrict land access, limiting the ability of local farmers to cultivate sustainably. Conversion of natural land to built-up areas occurred on 7.5% of the case study area between 2000 and 2020, illustrating the pressure of infrastructure development.[41]

41 Potapov, P., Hansen, M.C., Pickens, A., Hernandez-Serna, A., Tyukavina, A., Turubanova, S., Zalles, V., Li, X., Khan, A., Stolle, F. and Harris, N., 2022. The global 2000-2020 land cover and land use change dataset derived from the Landsat archive: first results. Front. Remote Sens. 3: 856903. doi: 10.3389/frsen. ***https://doi.org/10.3389/frsen.2022.856903***

Communities have responded with a combination of traditional ecological knowledge and technological innovations. A decentralized wastewater treatment system now supplies irrigation water through a 2,100-meter pipeline, revitalizing 64 *dunums* (16 hectares) of farmland and directly benefiting 35 farmers. A 250-cubic-meter storage tank and 11 subsidiary water networks ensure efficient distribution while reserving freshwater for high-value crops. Farmers integrate traditional practices such as crop rotation, inter-cropping, and organic composting with modern wastewater reuse techniques to enhance soil fertility and ecosystem resilience. Ecosystem restoration efforts, including clearing invasive vegetation, replanting native trees, and improving habitats for pollinators, further strengthen local ecological health.

Organizational and institutional mechanisms support these practices. The Kafr Jamal Agricultural Cooperative, formed by local farmers, oversees water distribution, infrastructure maintenance, and coordination with external partners. A community-led advisory committee reinforces participatory governance, ensuring local knowledge and priorities shape interventions.

These interventions have produced measurable environmental and socio-economic outcomes. Treated wastewater reuse has improved soil fertility, boosted microbial activity, increased crop resilience, and enhanced overall agricultural productivity. Sustainable irrigation techniques have facilitated the regeneration of native plant species, supported biodiversity, and strengthened food security. Collectively, these practices demonstrate how smallholder farmers, through integrated management of water, land, and knowledge systems, can assert rights to land and water under sustainable land governance principles, while restoring degraded farmland and ecosystem health.