

Desert Orchard

With a global population expected to reach 8 billion people by 2030, water scarcity will be a key factor affecting food security, socio-economic development and ecological preservation. An important method for addressing the world's water shortage is the utilization of high-quality recycled water for agriculture in place of scarce and expensive fresh water. A collaborative effort between the IALC and researchers in three important agricultural regions of Israel addressed the water crisis by providing practical water reclamation solutions and water management technologies that can be applied to arid and semi arid regions worldwide.

Dr. Elaine Solowey, Director of the Center for Sustainable Agriculture at The Arava Institute for Environmental Studies in the high Negev, worked with researchers from Beersheva (Ben-Gurion University), and the Nablus area of the Palestinian Authority (Biodiversity and Environmental Research Center) to develop a water management system that utilizes undervalued water resources, including erosion-causing run-off, hyper-saline solutions and non-sewage wastewater. Using these resources in place of fresh water, the team successfully propagated, planted and grew native trees in depleted and marginal areas that have been severely affected by water shortages.

The IALC Stands Ready to Meet Your Research & Development Needs



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The trees serve two vital purposes. First, they help to mitigate wind and water erosion in vulnerable areas, ultimately increasing the productivity of arid lands. Secondly, they provide an additional source of fodder for grazing animals, which is especially useful during droughts and the periods when spring growth has already been eaten by the herds.

To complete this IALC funded project, Solowey and the research team orchestrated a strong working partnership between Bedouin and kibbutz-based goat-herders in the far south, Bedouin and Jewish private farmers near Beersheva and competing groups of Palestinians (nomadic and non-nomadic) near Nablus. The results of this project offer a viable solution for water scarcity and drought but, perhaps even more importantly, suggest a promising way to ease tensions between communities competing for ever-decreasing water resources.



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Seafood in the Desert

For over ten years, Dr. Kevin Fitzsimmons, Professor and Extension Specialist at the University of Arizona, has been working, with the support of the IALC, on solving the world's water and food crises by raising edible seafood in the desert and using the salty water they're housed in to grow crops. And he's been successful.

The outcome of a study in the southern Arizona desert showed that olive trees grew faster with the salty effluent discharge from a shrimp aquaculture system than did the control grove treated with fresh well water.

The results of the study have meaning for the approximately 40% of the world's land that lies in arid and semiarid zones where much of the water that exists in underground aquifers is warm and somewhat salty. Though not suitable for human consumption, it is the type of water in which some seafood thrives. Using that water for desert fish farms, and subsequently salt-tolerant crops, may provide a two-fold answer for some of the water conservation and food issues driven by the ever-increasing world population.

Since the conclusion of the study in 2003, Dr. Fitzsimmons, working with the IALC, has fostered a new international collaboration with Samuel Appelbaum, the head of Israel's Bengis Center for Desert Aquaculture in the Negev Desert at Ben-Gurion University of the Negev. Together they have presented the concepts for Integrated Agriculture-Aquaculture systems across the globe to key professionals in the field, and from 2004 through 2012, aquaculture production has increased 8 percent annually worldwide.

Integrating aquaculture and agriculture systems offers a proven approach for managing two global issues simultaneously: producing food while conserving water.



Collaborative Rehabilitation

The IALC works with local leaders to create new economic opportunities for communities.

Because of prolonged periods of drought, new government policies, decreased availability of public grazing lands, and restrictions to mobility, the Bedouin way of life has been forced to transition from a nomadic culture towards more sedentary methods of living, raising livestock, and utilizing the land. This has caused significant changes in traditional income sources, increases in poverty levels and a loss of cultural cohesiveness.

In December 2007, Sheikh Hussein Abunweir, a local Bedouin leader in the town of Qurain, Jordan, and other community members, worked alongside Dr. Derek Bailey, a rangeland extension specialist from New Mexico State University and Dr. Raed Al-Tabini from the Badia Research and Development Centre in Jordan to conduct collaborative research on the potential use of forage kochia, a perennial

shrub, and native perennial grasses for rangeland rehabilitation of the rugged, remote terrain in Jordan. The results of the study revealed that forage kochia is a successful, cost-effective restoration tool and Sheikh Hussein has since begun developing new enterprise plans for harvesting kochia seed for rehabilitation projects in other parts of Jordan.

Sheikh Hussein has played a pivotal role in the success of this project. His personal and traditional knowledge of the Badia lands provide the necessary support for range-focused research initiatives and his connection to the Badia culture helps create new economic opportunities for his community. The collaboration between this community leader, scientists, extension specialists, and government officials, coordinated through the IALC, has proven to be a successful model for participatory research in arid lands.