

The Link Between Nature’s Evolution and Human Innovation for Survival and Prosperity in the Desert

Mohammad Amereh – Masume eshtiaghi

In Jordan, we saw that nature’s manual—shaped over thousands of years—can inspire human innovation to produce more food with less water while at the same time protecting the fragile desert ecosystems.

Lessons from the Desert

For thousands of years, plants have adapted to water scarcity and the harsh conditions of the desert. Survival and reproduction with the least amount of water is the first law of endurance in the desert. They achieve this through deep roots, smart timing, and frugal growth. This is the picture that can be seen in the Royal Botanic Garden of Jordan: hundreds of native plant species resistant to heat and drought that have supported the survival of human communities in the desert.

With the beginning of the modern era, population growth, and a consumerist lifestyle, the need for more food has become undeniable. Nature alone can no longer provide for this demand, and increased production requires greater pressure on the environment. This has led to the depletion of groundwater reserves, soil erosion, drought, dust storms, and the destruction of ecosystems.



This is the point where the magic of technology, in harmony with the power of nature, changes the rules of the game. Modern technologies, inspired by “nature’s evolution” and this “golden law of survival,” strive to increase agricultural production, ensure food security, and protect water resources by developing high-yield, low-consumption, and resilient varieties.



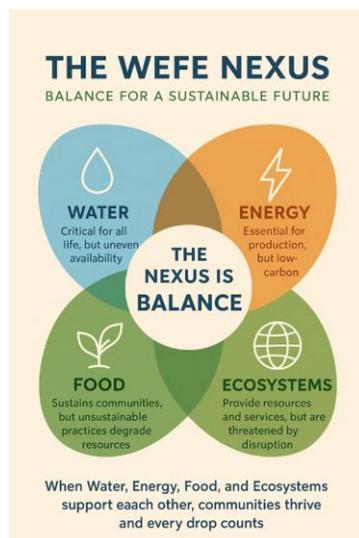
Thus, the phenomenon of evolution and innovation contributes to greater efficiency, lower consumption, and sustainable resource management. Teams working tirelessly—through precise scientific experiments, learning from nature, and relying on the “theory of natural selection”—have operationalized efficiency. This happens through improved varieties, precise water management, and locally adapted cultivation methods. The goal is not “greater input consumption” but the creation of smarter systems: crops that yield more with less water. With a fixed water input, this system delivers higher and better-quality output.

At the Royal Botanic Garden, the focus on native and adapted species highlights an important principle: work with nature, not against it. At Technoseeds, the emphasis on innovation—seed improvement, precision cultivation, and quality control—demonstrates how export-oriented producers can remain competitive in the global market while using less water and meeting environmental standards.

The WEF E Nexus in Action

Integrating technology with nature’s evolution provides a pathway to implement the water-energy-food-ecosystem (WEFE) nexus.

- Using less water to produce crops—through improved varieties, irrigation timing, and soil care—makes the water-food link possible.
- Energy-conscious processes (pumping, treatment, optimized cooling) reduce costs and waste, aligning with the water-energy link.
- Selecting adapted species and reducing chemical use helps soil and biodiversity, creating the food-ecosystem link.
- Finally, the ecosystem-water link is strengthened by healthier soil and vegetation, which improve water infiltration, reduce erosion, and make every drop last longer.



When these links are designed together, farms become resilient units—not just lands dependent on more water. Therefore, applying solutions from ecology, indigenous knowledge, and technology at small scales (plots, greenhouses, processing units), while meeting export standards (quality, traceability, water footprint), turns sustainability into a competitive advantage. Ultimately, monitoring water use, yields, and soil health paves the way for investment and policy support, making this model replicable and implementable elsewhere.

We Are Compelled to Adopt Smart Solutions Combining Technology and Natural Evolution

Across the Middle East, droughts are longer, heat is more intense, and water is scarcer. The choice is no longer between producing crops or conserving resources. The goal is to design models that achieve both at the same time. The models we saw in Jordan demonstrate that farmers can produce more with less water, ecosystems can suffer less damage than ever before, and consumers can access safer, more reliable products.

Therefore, in dry and water-scarce lands, resilience is not a slogan—it is a smart and essential choice. When we learn from deserts and the historical wisdom of our ancestors in the Middle East, and add intelligent technology, every drop of water doubles in value: once for people, once for nature.



Short version

For thousands of years, plants and trees have found ways to survive in the heart of dry and water-scarce deserts. They have learned to live, grow, and reproduce with the least amount of water. This process of evolution has not only sustained nature itself, but also enabled human communities to build their lives and livelihoods by relying on the products of these very plants.

Today, technology stands alongside this natural legacy. By learning from how plants adapt to harsh conditions, scientists and innovators are working to cultivate more resilient and productive crops—plants that can meet the demands of a growing population while putting less pressure on water and soil resources.

This synergy between the power of nature and the magic of technology is the lesson we learned during our visit to the Royal Botanic Garden of Jordan and the innovative company Technoseed. It is a new and creative path that can ensure food security for humanity in hot, arid deserts, improve the quality of life for both people and animals, and at the same time protect water resources and the environment.