ISRAEL CONTRIBUTION

"Irrigated Agriculture"

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Irrigated Agriculture – The Israeli Experience

The geographic location of Israel and scarcity of natural water resources on one hand and intensive agricultural cultivation on the other characterize irrigation and the sustainable water use efforts in Israeli agriculture.

To understand the current situation in water use, a few given data and technological evolution perspective may be considered.

**Background**

Majority of agricultural land is owned, allocated and administered by the state. Water sources are also owned publically as well (Water Law, 1959), via the Water Authority. Farmers are leasing agricultural land for long term and are allocated with annual water use quotas.

About 50% of the cultivated land is irrigated and includes mainly irrigated vegetables, orchards and summer field crops.

Till late 70's, most of the water allocated for agricultural use was fresh whereas nowadays it has declined to about 50%. The rest consists of brackish water (about 30% of treated recycled effluent, and about 20% of saline water and rainwater catchment).

**Technological Evolution- Milestones**

- **50's – mid 60's** – Enlargement of irrigated areas, mainly by using fresh water and surface irrigation. State support in different aspects of infrastructure - Water Law, establishment of National Water Company, water conveyance and distribution systems, agricultural R&D and extension.

- **Mid 60's – mid 70's** – Building and operating the 'National Carrier' which still continues supplying fresh water from the north to the center and south (for urban, industrial and agricultural use). Shifting from surface to pressurized irrigation (mainly sprinkler irrigation and beginning of other localized irrigation methods such as drip and micro-sprinklers). In addition metering, some automation and fertilizers application (fertigation) technologies were also developed in this period. Shift to new and more efficient irrigation systems supported.
• Mid 70's – late 80's – Israeli irrigated agriculture shifted fully to pressurized irrigation (sprinkler and drip) while increasing water use efficiency per unit area (about 20%). The wide use of pressurized and localized irrigation boosted technological development in auxiliary fields such as filtration, fertigation, automation, valves and, metering systems adding to rising shifts in water use efficiency and at the same time in crop productivity. Fresh water scarcity led to increased use of saline water as well as treated recycled effluent.

• Late 80's – late 00's – Consecutive droughts led to sharp decreases in fresh water allocation for agriculture compensated to a great extent by an increasing rate of treated waste water use (sewage collection, effluent treatment and recycling). This led to development and use of monitoring as well as production management technologies regarding the quantity, quality, efficiency and sustainable water use. At the same time efficiency increased through new technologies and instruments used (filters, automation and communication, pressure regulated drippers, new types of emitters).

• Current stage – Decreasing amounts of fresh water and increasing amounts of marginal water for irrigation (treated recycled effluent, saline and rainwater catchment). Increasing use of recycled treated wastewater led to establish new regulations. Multi-stakeholders committee (ministries, institution, users, producers, NGO's) yielded in 2010 national regulations for the production and use of high quality treated recycled effluent (considering aspects of human health, agriculture and environment). Introduction of desalinated water into the national water system (mainly for urban use) is expected to improve the quality of treated recycled effluent used in agriculture in the coming years. Continuous emphasis is on sustainable agricultural technologies, management and practices.

CONCLUSION

• Israeli agricultural sector has a dynamic character with its highly adaptive active farmers, supported by R&D and extension.

• The close and almost real time cooperation between farmers, extension and R&D allows relatively quick and basic solutions to the problems.
Many of the manufacturers of irrigation and water technologies are located in farming settlements, thus allowing fast and to the point technological solutions.