Irrigated Agriculture – The Israeli Experience

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Water and irrigated agriculture in a time perspective

Land and water in Israel are public assets (allocated by quotas)

Photo: E. Kenig
Irrigated Agriculture in Israel – Milestones

50’s – mid 60’s

- Enlargement and establishment of water sources and irrigated agriculture
Irrigated Agriculture in Israel – Milestones

50’s – mid 60’s

- **Infrastructure** – Legislation and regulation, increased operation of the National Water Company ‘Mekorot’ (established in late 40’s), water conveyance and distribution systems, Public Agricultural R&D and Extension services.

- **Fresh water** use, mainly by **surface irrigation**

- **Non-traditional farming sector** (open to innovations and technology adoption)
Irrigated Agriculture in Israel – Milestones

mid 60’s – mid 70’s

- Building and operating the ‘National Carrier’
- Shifting to more efficient irrigation
Irrigated Agriculture in Israel – Milestones

Mid 60’s – mid 70’s

• **Infrastructure** – ‘National Carrier’, Water conveyance and distribution systems, Agricultural R&D and Extension services.

• **Shifting** from surface to pressurized irrigation, increasing water use efficiency.

• Development and introduction of metering, automation, filtration and fertilization technologies.

• Mainly fresh water use.
National Water Carrier (early 60’s)

National Water Carrier:
60% of water supply in the 1960’s

Haifa
Netofa
Tel Aviv

108” Pipeline

Sea of Galilee

“Mekorot”
Irrigated Agriculture in Israel – Milestones

**mid 70’s – late 80’s**

- Full shift and adoption of pressurized irrigation systems
- Development of auxiliary technologies
- Increased use of brackish water
• Agricultural irrigation is **fully pressurized**, a technological change which led to a country-wide increased water use efficiency.

• Continuation of development and introduction of metering, automation, filtration and fertilization technologies.

• **Increased use** of brackish water (saline and recycled treated wastewater).
Pressurized irrigation systems

Increased water use efficiency from 40%-50% in surface to 80%-95% in pressurized irrigation
Irrigated Agriculture in Israel – Milestones

Late 80’s – late 00’s

- Increased rate of collection, treatment and use of treated wastewater
- Continuous development and use of monitoring technologies
• Consecutive droughts leading to sharp decrease in fresh water allocation for agriculture.

• Hence, increasing rate of collection, treatment and recycling treated wastewater.

• Continuous effort in maintaining productive, yet sustainable irrigated agriculture.
Water for agriculture
1985-2008

Source: Planning Authority, MARD and Water Authority, MIS
Irrigated Agriculture in Israel – Milestones

Current

- New national regulations for unlimited use of recycled treated wastewater
- Introduction of desalinated water
- Emphasis on sustainable technologies as well as management
• Increased use of recycled treated wastewater led to formation of national regulations (2010) taking into account human health, agronomic and environmental aspects.

• Introduction of desalinated water into the national water system.

• Scarce water and land resources motivates continuous innovations for more efficient and sustainable water use.
TWW reuse
Water for agriculture
1969-2008

Source: Planning Authority, MARD, Water Authority, MIS and Prof. Kislev, Y. – Review on water resources no. 9705)
Sea water desalination

Construction phase. Production at 10/09

Pre tendering stage

Full production
Since 9/07

Full production
Since 12/05

Pre tendering stage/
Financial Agreement

Source: Water Authority
Public R&D and Extension services
Land use (2007)

Source: Planning Authority, MARD
Water use efficiency
(production output / water use)
1950-2008

Source: CBS and Planning Authority, MARD
Summary

• Irrigated agriculture and agricultural technology in Israel are part of an integrated chain and not an independent issue.

• Close contact, participation and cooperation between all stakeholders allow identifying constrains, solutions, know how adoption and diffusion.

• Current emphasis is on efficient and economic, yet sustainable management

• The same technology can be adopted and diffused in different manners and situations (drip, for example)
• In a perspective of 60 years, water use and irrigated agriculture in Israel is an ongoing process which has been resulted in technological developments, managements and adjustments according to the changing conditions (physical, economical, social and environmental).
Thank you