Ministry of Agriculture and Rural Development, Israel

Irrigated Agriculture – The Israeli Experience

Anat Lowengart-Aycicegi
Extension Service

United Nations Commission on Science and Technology for Development
Panel on Water and Agriculture

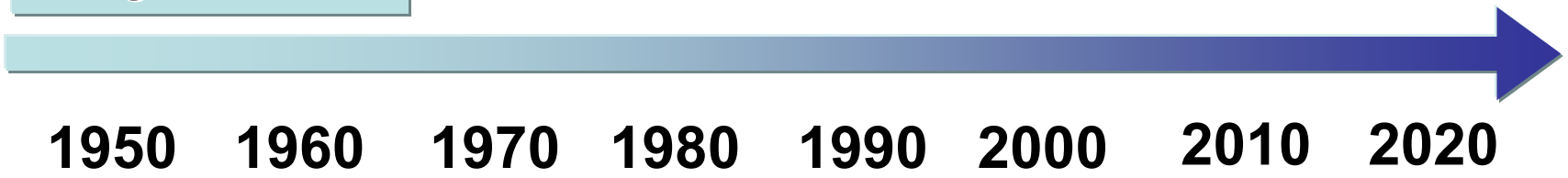
December 2010


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**

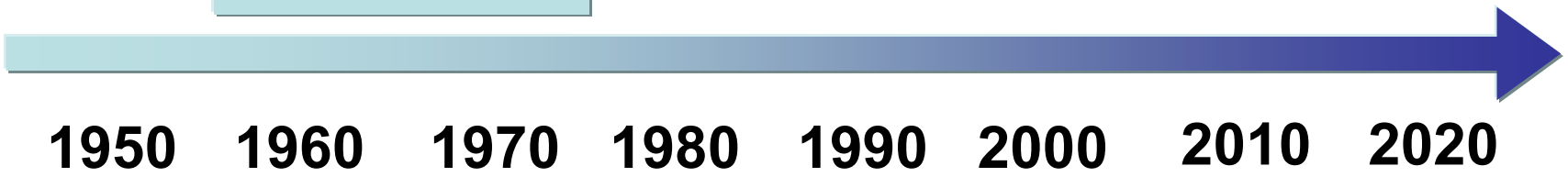
- **Non-traditional farming sector** (open to innovations and technology adoption)

Irrigated Agriculture in Israel – Milestones

mid 60's – mid 70's

- Building and operating the 'National Carrier'

- Shifting to more efficient irrigation



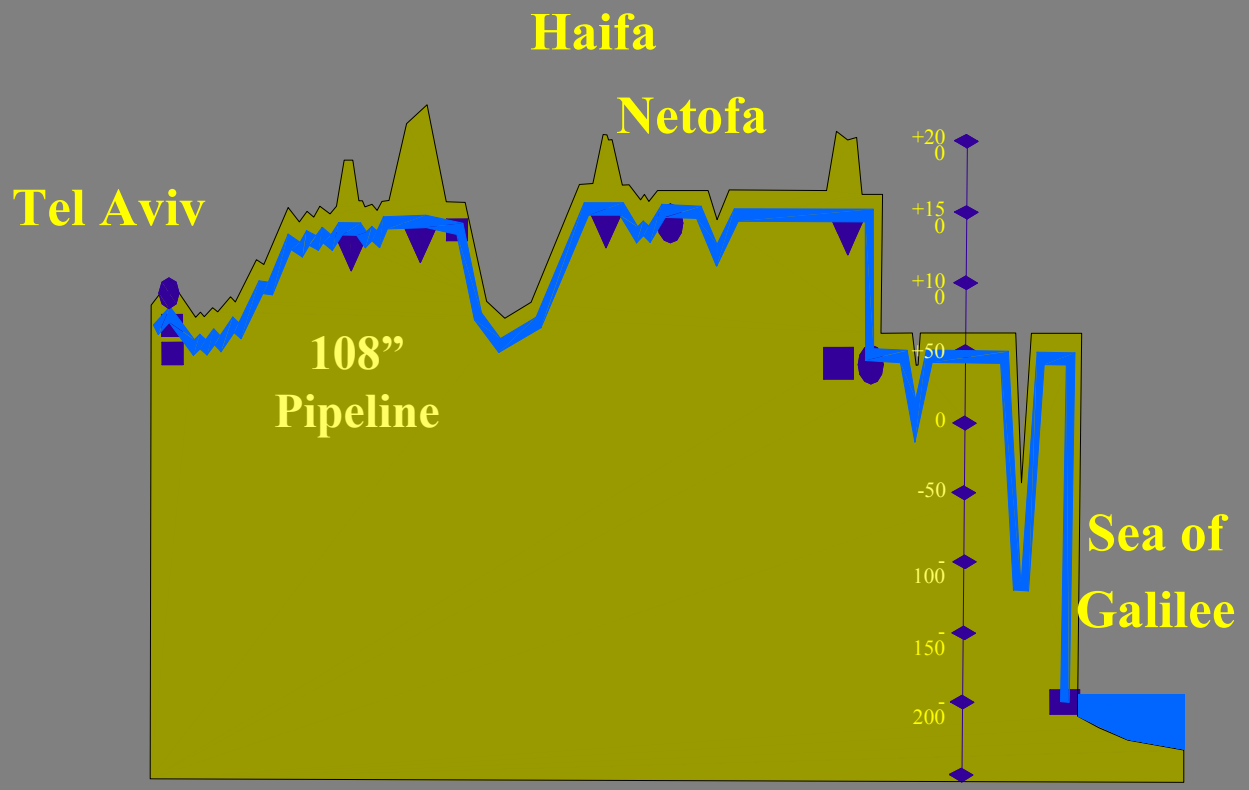
Irrigated Agriculture in Israel – Milestones

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



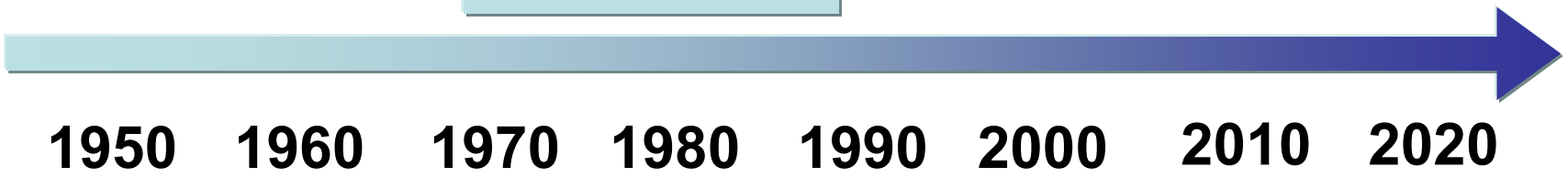
Irrigated Agriculture in Israel – Milestones

mid 70's – late 80's

- Full shift and adoption of pressurized irrigation systems

- Development of auxiliary technologies

- Increased use of brackish water



Irrigated Agriculture in Israel – Milestones

Mid 70's – late 80's

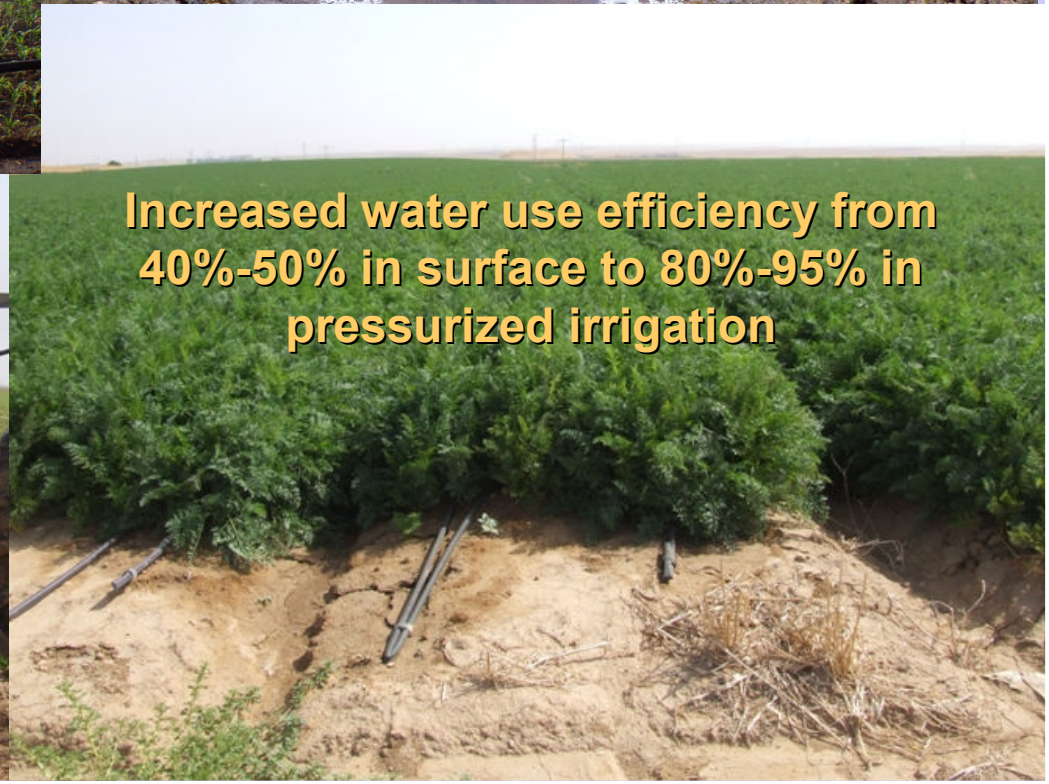
- Agricultural irrigation is **fully pressurized**, a technological change which led to a country-wide increased water use efficiency.
- Continuation of development and introduction of metering, automation, filtration and fertilization technologies.
- **Increased use** of **brackish water** (saline and recycled treated wastewater) .

Pressurized irrigation systems









Increased water use efficiency from 40%-50% in surface to 80%-95% in pressurized irrigation












סכנה !
מי קולחין השתיה אסורה.



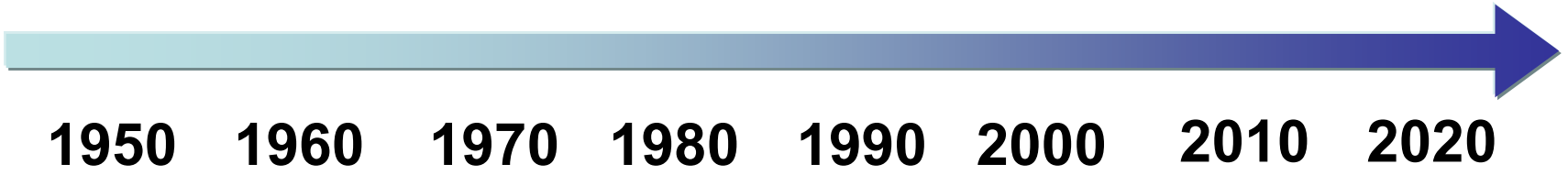
Photo: M. Bruner

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



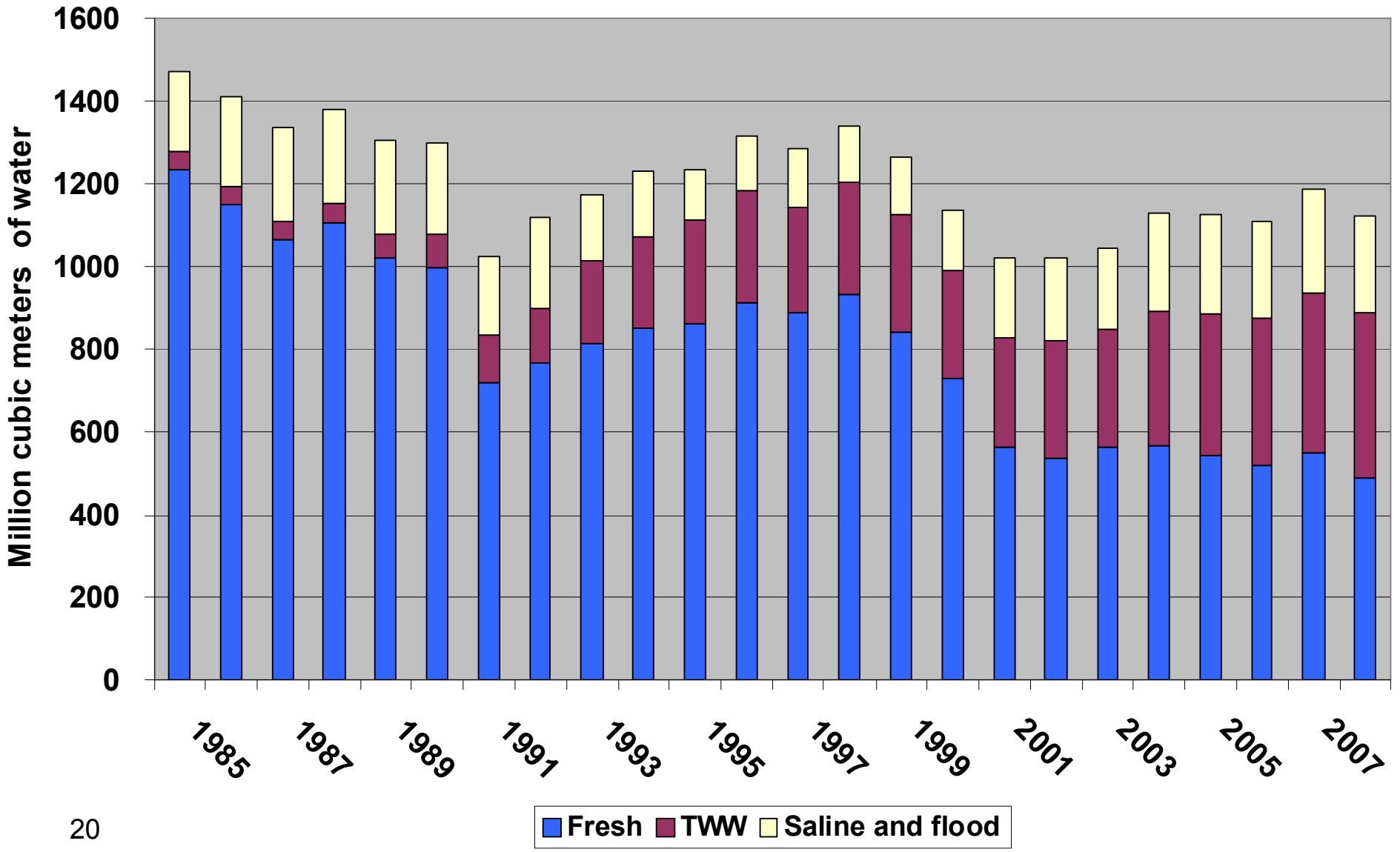
Irrigated Agriculture in Israel – Milestones

Late 80's – late 00's

- 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


Mottes
TENSIOMETERS
GSM
LOGGER ALARM SYSTEM
http://www.tensiograph.com

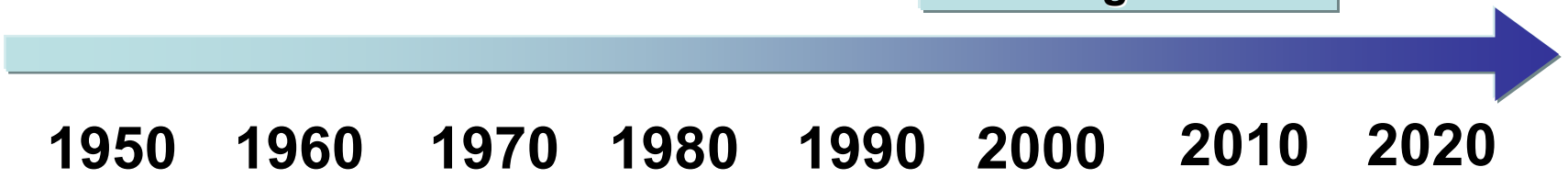
Irrigated Agriculture in Israel – Milestones

Current

- New national regulations for unlimited use of recycled treated wastewater

- Introduction of desalinated water

- Emphasis on sustainable technologies as well as management



1950 1960 1970 1980 1990 2000 2010 2020

Irrigated Agriculture in Israel – Milestones

Current

- 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








מים אסורים לשתיה
DRINKING WATER PROHIBITED
ممنوع شرب الماء
คำเตือน ห้ามดื่มน้ำในขณะเก็บผลไม้หรือในช่วง
ที่กำลังเทผลไม้ลงในถัง

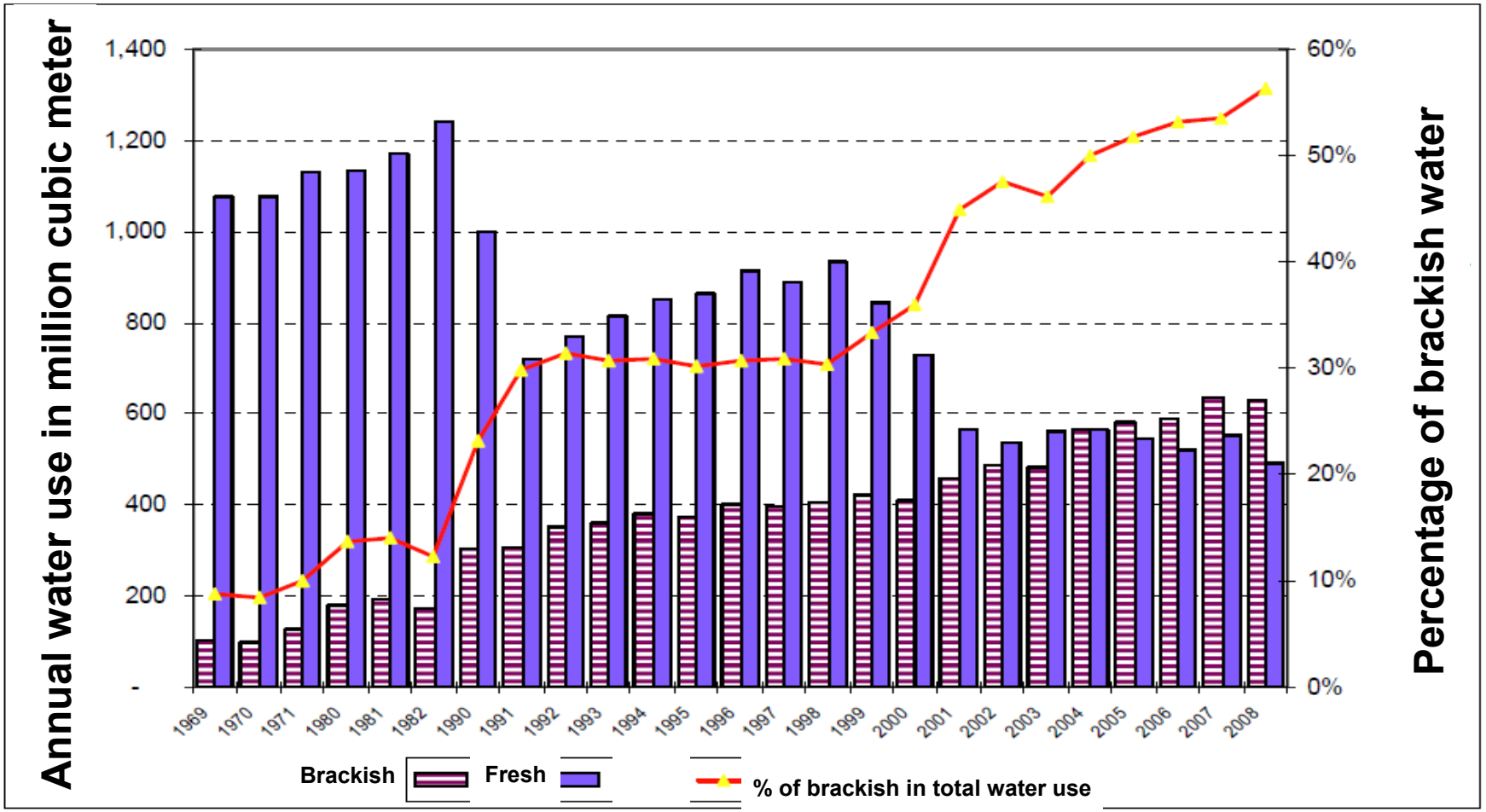






Water for agriculture

1969-2008



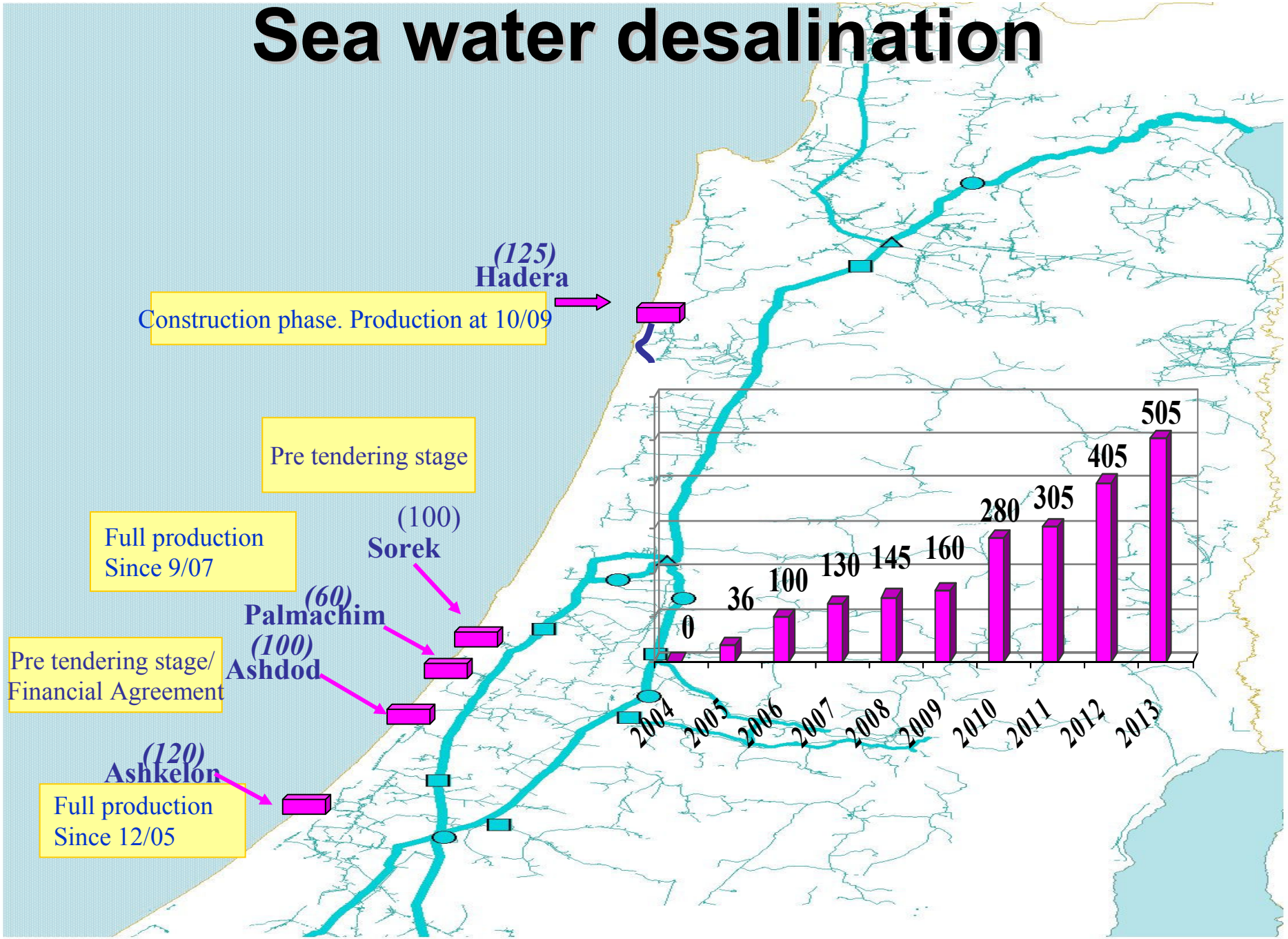
מקור: רשות המים, ל.מ.ס , פרופ' יואב כסלו: "משק המים – סקירה מאוירת " (מס 9705)

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



Photo: Tarchitzky, Water Aauthority

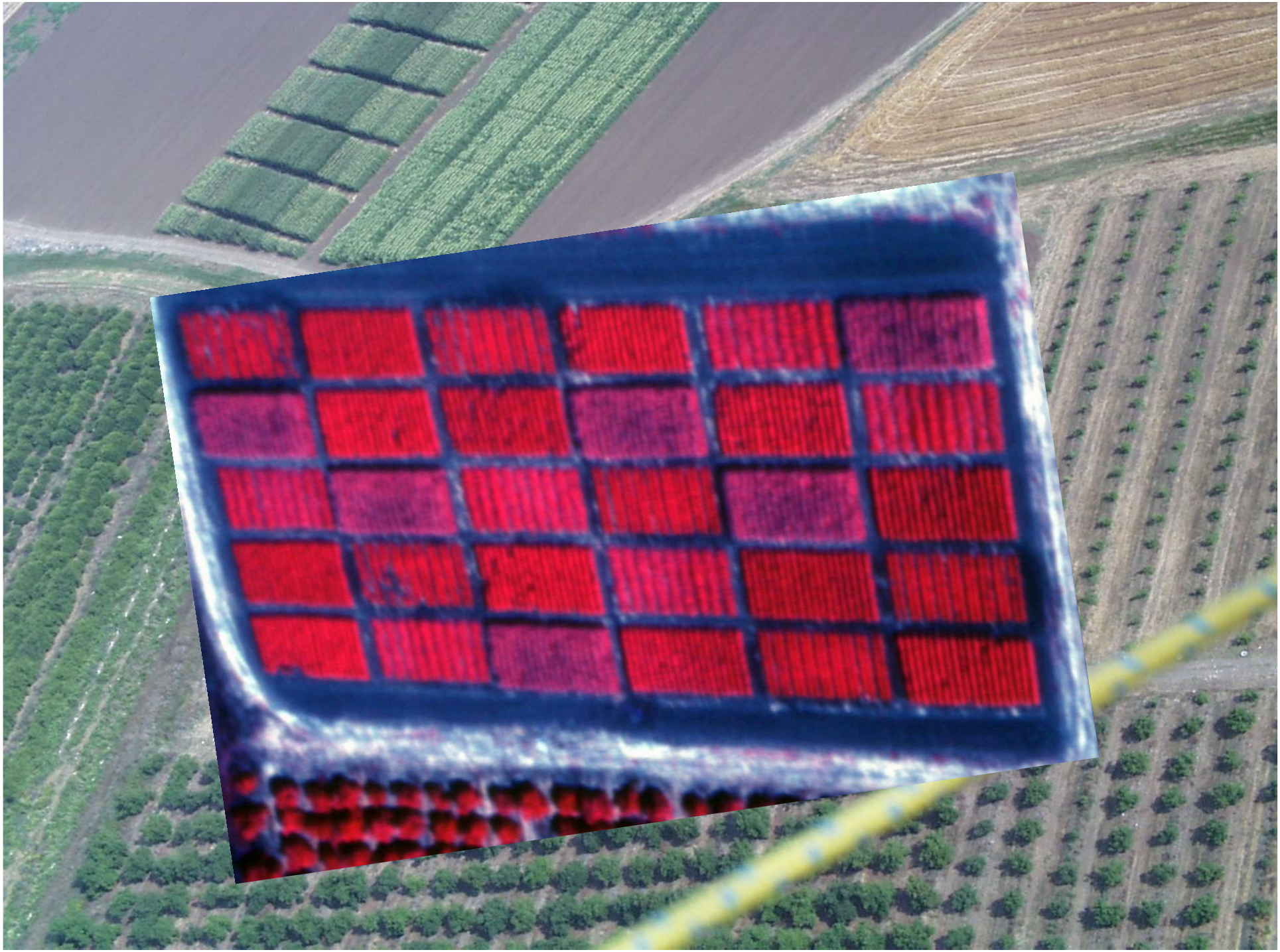
Sea water desalination



Source: Water Authority

Public R&D and Extension services



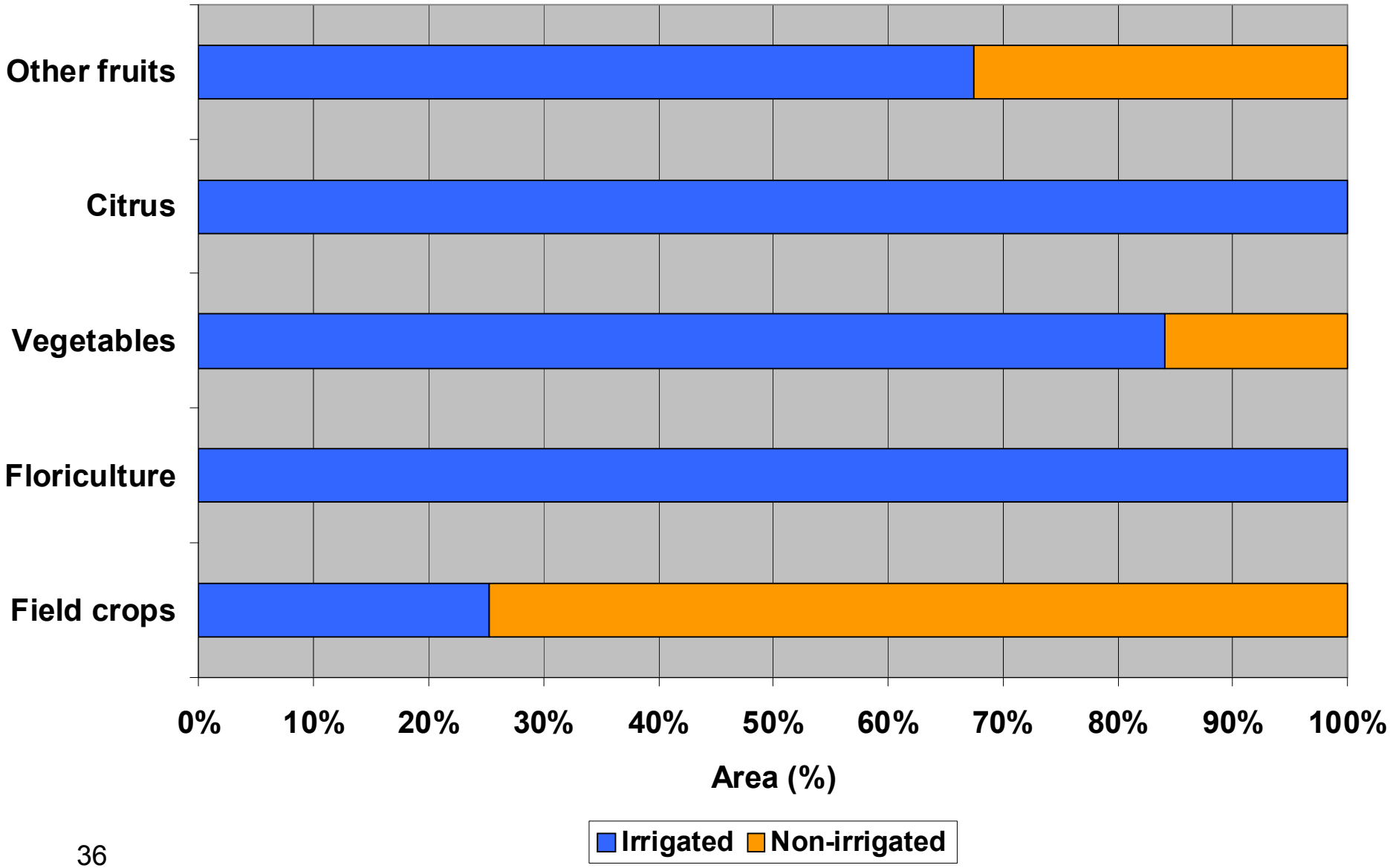






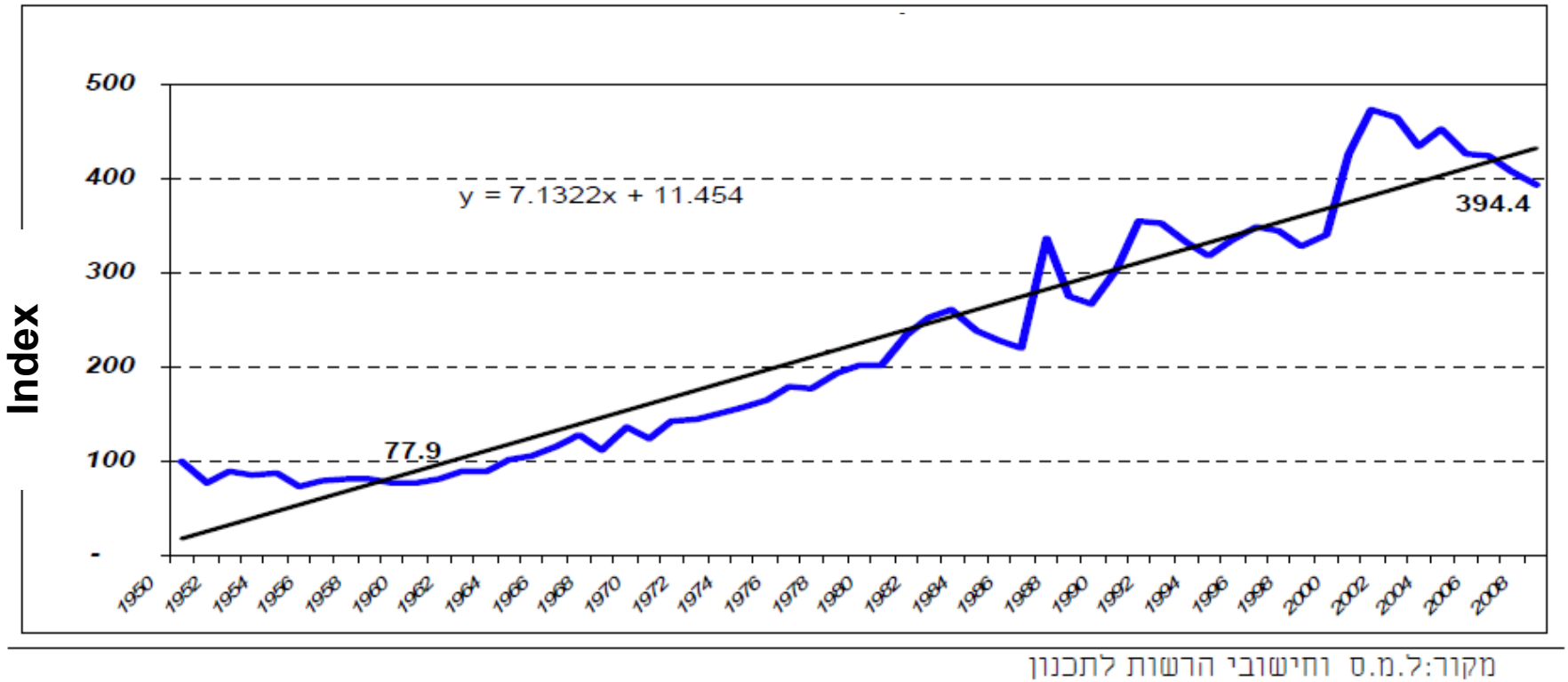


Land use (2007)



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)

Summary (cont.)

- 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).