

Middle East Water Issues **(Water as a window of opportunity)**

Saul Arlosoroff – Consulting Engineers

(Tel 972-3-6483279 Fax:972-577 977 720) (sarlo@inter.net.il)

Word Bank Presentation

21/8/2008

Main Water Supply System

Lebanon

Syria

Tel Aviv

Sea of Galilee

Palestinians

Jerusalem

Egypt

H.K. Jordan



Water Demand Management- “10 – Commandments” Strategy

*** “The cheapest un-utilized water resources”**

- 1. National Assessment of water resources, master planning. Transfers of water/integrating resources. Nation wide ground water development, and control.**
- 2. Legal basis, water code and regulations, institutional responsibility, options to promote efficient water use.**
- 3. Comprehensive water metering of all water producers & consumers.**

cont.

Cont

4. **Research & Development of optimal water use Norms, allocations, technology development.**
5. **Water pricing structures – progressive block rates. Sanction rates.**
6. **Wide scale introduction of pressure irrigation systems, drip irrigation and automation mainly Horticulture, cotton, parks, gardens.**
7. **Completion of total sewerage systems, secondary & tertiary treatment of wastes.**
8. **Water exchanges/trading policy. Farmers are receiving treated effluents in exchange for fresh water allocations. Govt. executed effluents transfer network.**

”Virtual water policy” – import of grains”

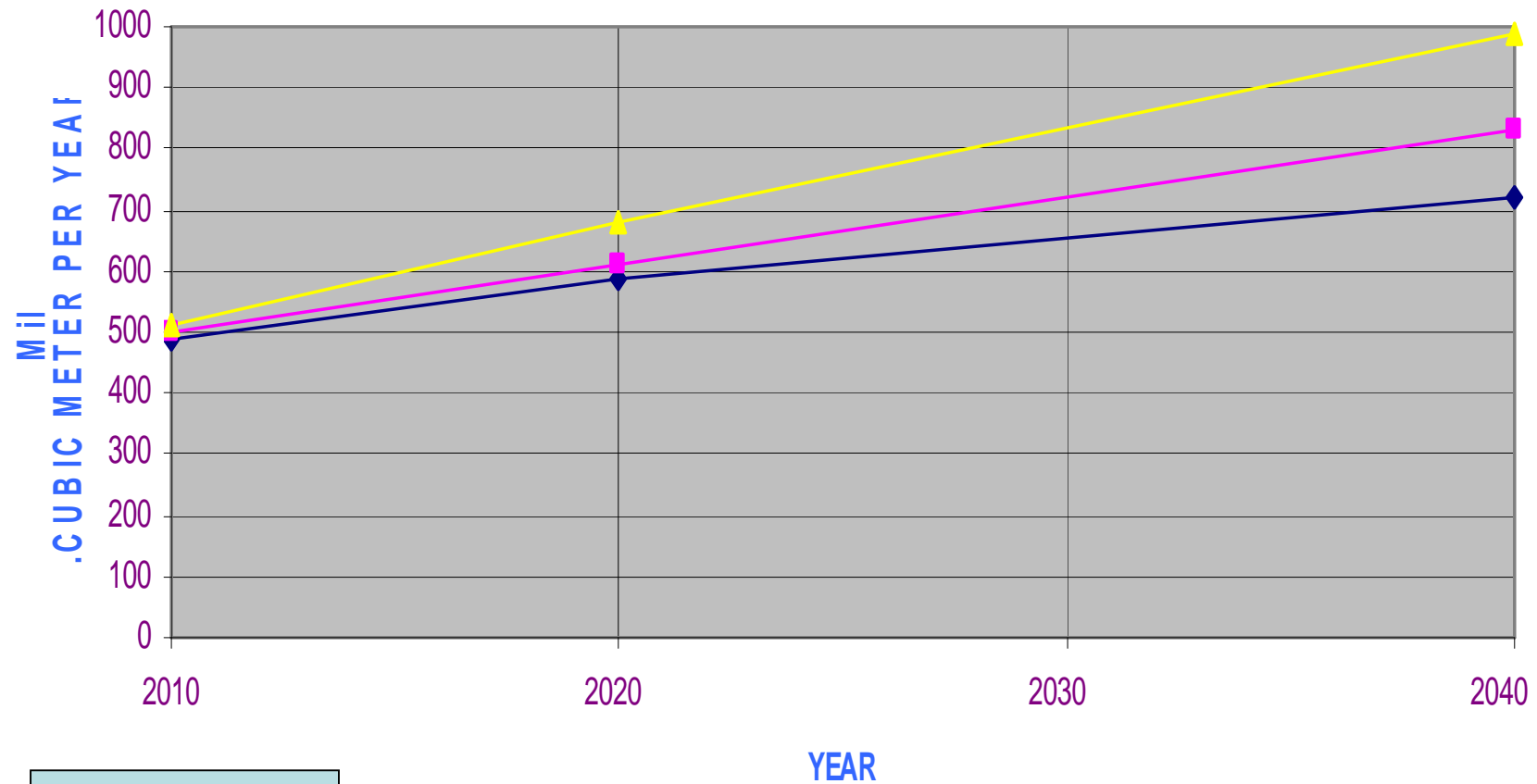
Cont.

- 9. Establishment of special funds.
Retrofitting of most irrigation systems and industrial processes, and selected urban consumers.**
- 10. Following comprehensive development and efficient use of most water resources – present program calls for Nation wide reuse of advanced treatment of waste water.
Large scale integration of Brackish and Sea Water Reverse Osmosis Desalination plants. (SWROD)**

Typical Desert land Under drip Irrigation – Savings of 40%



RE-USE OF SEWAGE EFFLUENTS [ISRAEL]



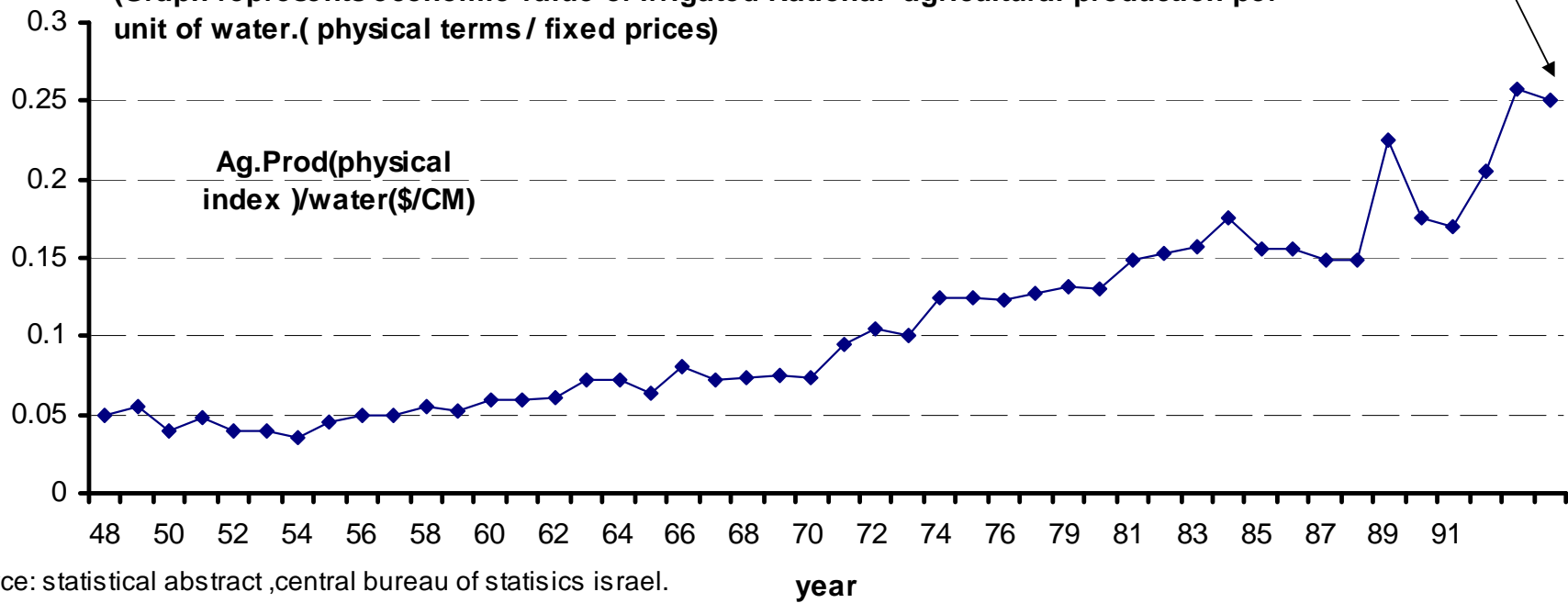
2010 will not be achieved

◆ LOW ■ BASIC ▲ HIGH

The Agricultural Sector - ISRAEL

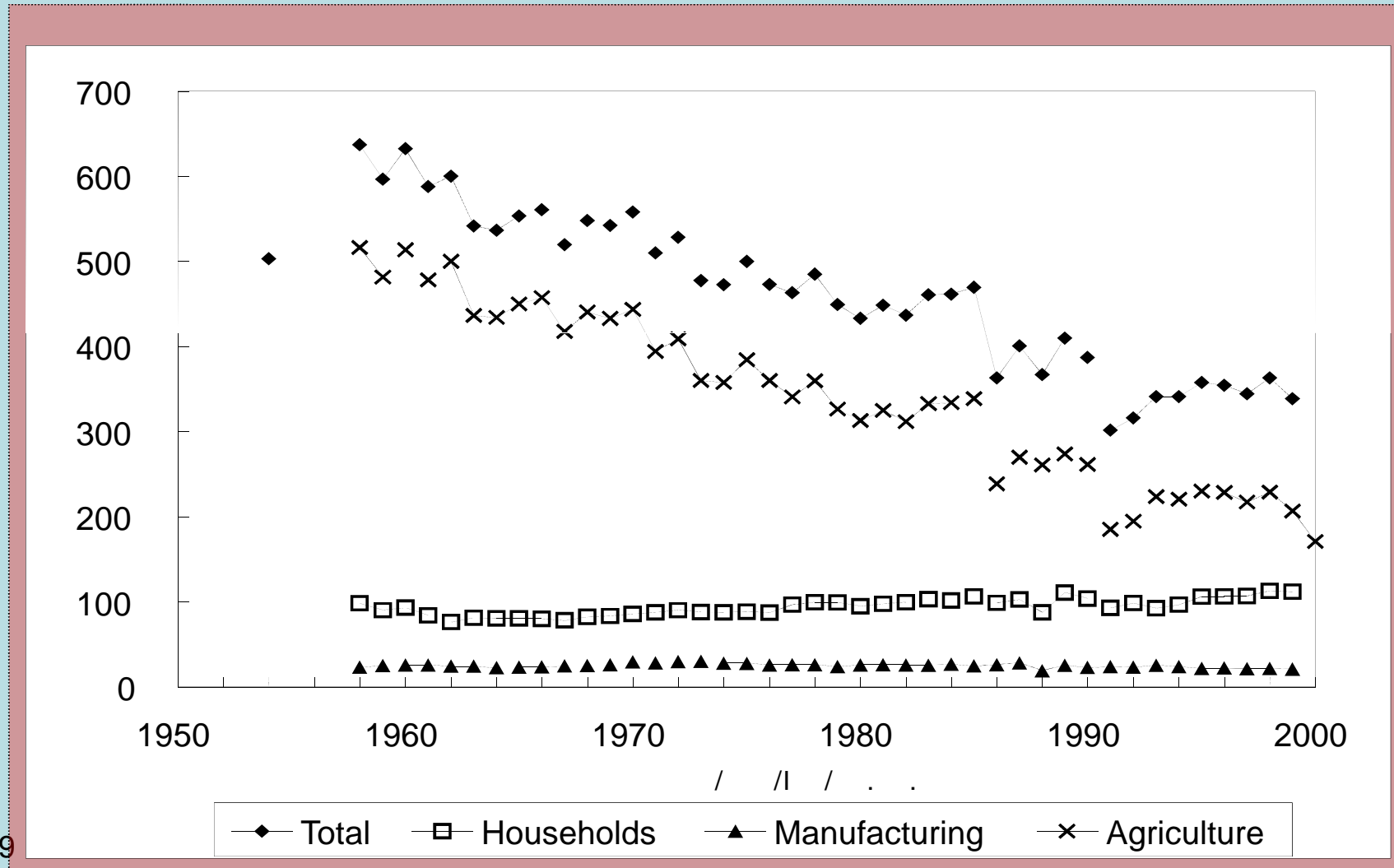
(Graph represents economic value of irrigated National agricultural production per unit of water.(physical terms / fixed prices)

2008



Per-capita Water Utilization

(Water use divided by the population in Israel)



Feasible Regional Alternatives

POPULATION PROJECTIONS

(Millions) (Source World Bank)

	1991	2000	2020	2040
Israel	5.0	6.5	9.1	12.8
Palestine (West Bank)	1.0	1.4	2.6	3.8
Palestine (Gaza Dist)	0.7	1.0	1.7	2.6
H.K.Jordan *	3.6	5.3	9.9	16.9
Total	10.3	14.2	23.3	36.1

THE FUTURE

- **WATER MARKET/TRADING**
- **SEA/BRACKISH WATER DESALINATION**
- **LARGE SCALE RE-USE OF EFFLUENTS**
- **INTER-BOUNDARY – TRANSFER OPTIONS (LITANI, DESALTED WATER, TURKEY).**
- **COMPREHENSIVE WATER DEMAND MANAGEMENT AND CONSERVATION.**
- **ACTIVE PSP, BANKS, DONORS.**

Economic costs Approximation (per cubic meter)

- Water unit costs of conservation --- **\$ 0.2**
- Reuse of waste water – Secondary **\$ 0.4**
 - Tertiary **\$ 0.5**
- **Brackish water - desalination** **\$ 0.6**
- **Sea Water - desalination** **\$ 0.7**

Inter boundary transfers: (added Marginal costs)

Coast to mountains	\$ 0.4- 0.5
Coast to Jordan	\$ 0.6- 0.8
Turkey to Coast	\$ 1.0- 1.2

Concluding Remarks

- Changes in Hydro and Geo-Political conditions in the Middle-East.
- Progress in the readiness of parties to discuss cross-boundaries options (Caesarea sea water desalination plant).
- Progress in the initial recognition of the need for regional cooperation and compromises

All views are of the lecturer himself
Thank you for your attention

Saul (Shaul) Arlosoroff