



**Thematic Week:** Water Economics and Financing

**Thematic Axis:** Water Markets

**Title:** Water Management in Israel: The Conspicuous Absence of Water Markets

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**Abstract:**

Almost all of the State of Israel can be characterized as “drylands” – with precipitation levels of only 500 mm/year or less. These lands were largely “barren” and the country’s soils highly eroded some 60 years ago. Like much of the near-east, the negative impact of human settlement on land productivity in a Mediterranean climate was considered to be inevitable. Today, however, some 35% of the country’s lands are either cultivated or afforested. (An additional 25% are set aside as nature reserves.) This complete reversal of historic fertility trends was possible due to policies that aggressively developed water resources, with enormous investment in water infrastructure and subsidies for agricultural water users. Rather than using water pricing or markets to control the demand for water, decision makers focused on expanding water supply. Later, demand management was limited to diffusion of irrigation technologies and reduction of municipal water wastes. The expansion of water supply was achieved initially through the transfer of water through a national water carrier and later through the intensive utilization of waste water. Drip irrigation and the establishment of 200 irrigation reservoirs have made present rate of 72% of effluent utilization possible. Given the focus on supply, water quality and compliance with environmental standards was largely ignored by government agencies for most of Israel’s history. This has begun to change with increased resources devoted to enforcement and a strengthening of standards. The focus on supply, however continues to this day with national water strategies relying on desalination to expand fresh water supplies by some 25% during the coming decade.

Economic analysis will surely find certain inefficiencies in Israel’s past and present water policies. Yet, in retrospect, Israel’s approach can be considered to be a rational strategy which allowed the country to use water to promote other national objectives (e.g., immigrant absorption, settlement of the periphery, combating desertification, food security, etc.) over pure economic efficiency. Israel’s successful development of desalination facilities has led to recent changes in certain accepted norms of its traditional water development strategy – for example, increased privatization of water production and supply as well as subsidy reduction and differential rate pricing for consumers. Yet, it is unlikely that the traditional policy orientation will change dramatically. As present inefficiencies in Israel’s traditional policy are relatively modest and as water promises to be a critical factor in future peace negotiations, non-market management strategies will probably continue for the foreseeable future. Indeed it is unlikely that markets will be welcome as a mechanism for resolving conflicts between Palestinians and Israelis over water due to the desire of Palestinians to enjoy full sovereignty over water resources and Israel’s aforementioned commitment to additional national objectives, beyond efficiency, in its utilization of water resources.

**Keywords:** water policy, Israel, water markets, Middle East, water supply.

## Water Management in Israel: The Conspicuous Absence of Water Markets

Israel's experience in water management is often considered unique, reflecting technological innovation, national commitment and ambitious development objectives. While there have been several mistakes along the way, the results of Israeli policies speak for themselves. During a sixty-year history, the country's population has grown seven fold: from one to seven million residents. (Orenstein, 2004) Natural water resources have not increased – but agricultural productivity has steadily increased and now is 1600% higher than it was in 1950! Through a strategy that aggressively utilizes waste water, drip irrigation and more recently desalinated sea water, Israelis enjoy a high quality of life which belies the remarkably low 300 m<sup>3</sup> per capita level of water (Tal,2006). This is far less than the minimum figure of 1000m<sup>3</sup> per person per year which is often defined as a standard for absolute water scarcity or the 1700 cubic meters/ person/ year (below which society's are defined as water stressed).

Recently, however, there are signs that present water production levels may not be enough. To begin with, consistent with projections of the International Panel on Climate Change, there appears to be a steady drop in precipitation in the country. What has been considered several consecutive years of drought may in fact reflect a new, and disturbing trend of reduced rainfall: During the past 16 years, annual average rainfall has fallen from 1,350 to 1,175 million cubic meters. The probability of having consecutive “drought years” as severe as the past four, is only 2%. (Israel Water Authority, 2008) Regardless of the long term climatic projections, the immediate future is ditruding, leaving Israeli water resources with a high likelihood of remaining below the so-called “red lines”for the next several years. These “red-lines” are water levels, below which water should not be pumped, as scientists believe that hydrological damage will take place. Figure 1 shows the updated expectations of actual availability water in Israel in the sundry natural sources, in comparison to their past levels.

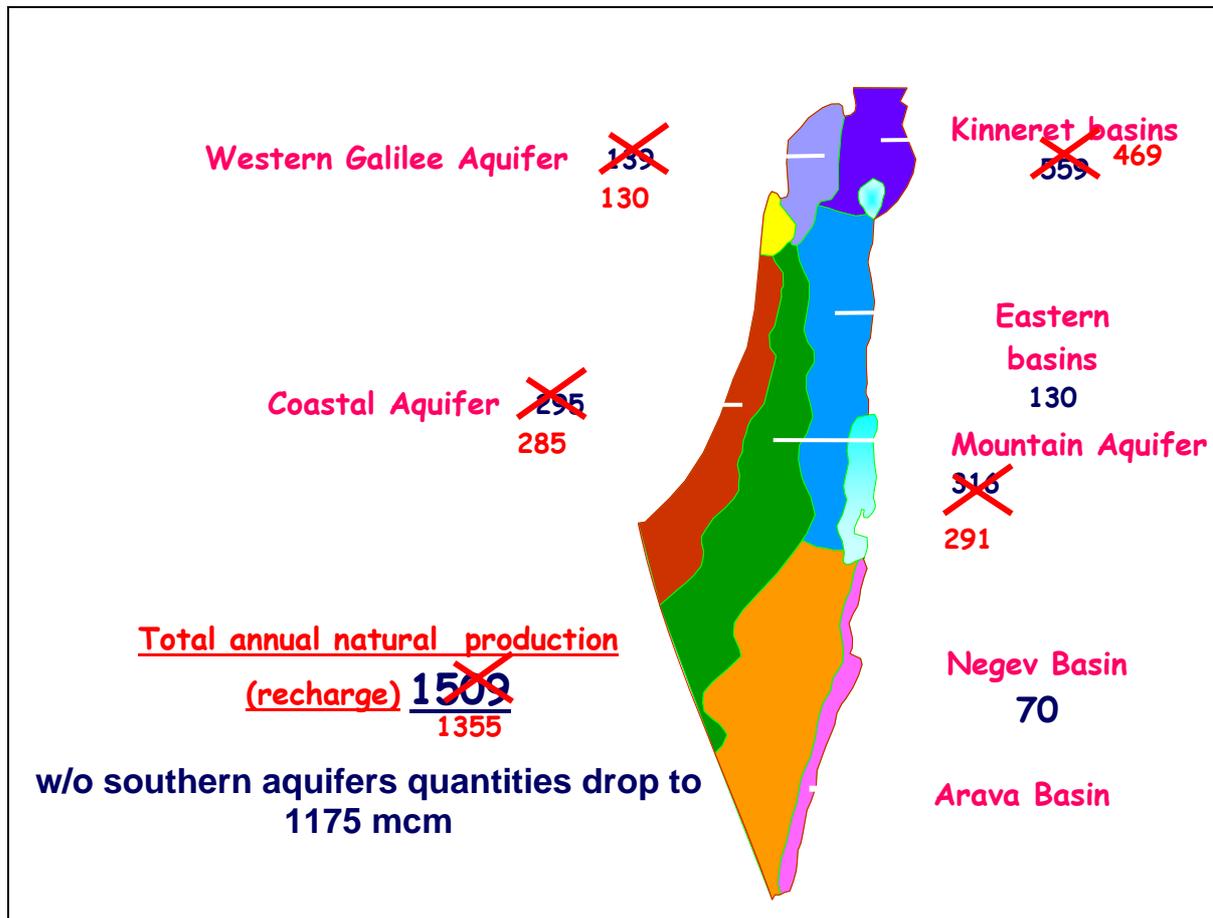


Figure 1: Israel's Water Resources: Updated Assessment, Israel Water Authority, 2008

Given the present situation and the need for immediate solutions for addressing the gap between supply and projected demand for water, this presentation asks a basic question should: "Can water markets play a role in addressing what may be a new scarcity crisis for the country?" To respond to the question, a brief review of Israel's historical approach to water pricing is instructive.

#### Water Markets in Israel – a History

For Israel, water was always more than a typical resource. The Bible mentions water over 450 times – reflecting a pervasive anxiety over steady supplies, produced by an agrarian society that relied on an unreliable rainfall to support its agricultural. It is little wonder that when the new Zionist economy began to emerge at the start of the twentieth century, water resource development was deemed the key to ensuring Jewish settlement in an otherwise semi-arid and dry-sub humid land. (Galnorr, 1980) Zionist ideology lionized the "new Jewish farmer" so that water development became an ideological axiom. As farming was perceived as playing a key role in establishing demographic facts in the ongoing geo-political battle for Israeli sovereignty, water policy was not simply an economic issue, but one of paramount national importance. Like investment in the military, investment in a water infrastructure was not something that was to be optimized to some efficient level, but a matter of national security that could not be subject to the local and international market forces.

Israeli water policy for most of the country's history, therefore, had little to do with economic realities or cost-benefit analyses. Institutionally, the country maintained a centralized, highly controlled system. At the top of the hydro-pyramid was the Water Commission – recently renamed, the Israel Water Authority. Within a decade of independence, a "Water Law" was enacted which cancelled any private rights to water – calling water "public property". To manage this public good, Mekorot, a national water utility and a highly regulated public corporation was given a special, official status. (Tal, 2002) The Water Commissioner, with the approval of Israel's Parliament, the Knesset set water prices. These were maintained at an artificially low level for farmers in order to allow them to produce inexpensive food not only for local consumption but for export. Mekorot sold water, frequently at a loss, but received government support to cover expenses. (Laster, 1980).

Moreover, prices were set at a single, uniform level nationally, regardless of the actual costs of production and delivery. This was part of a "hydrological Socialism" which characterizes national policy to this day. Water was taken from the "rich" regions in the northern Galilee and sent to the "poor" consumers in the dry southlands via a National Water Carrier. This enabled vast areas in the semi-arid and arid Negev desert region to become agriculturally productive areas. (Blass, 1973) It produced an interesting model for combating desertification and for many years a prosperous agricultural economy. But it also produced waste and inefficiency. Crops were frequently grown with little regard to the "hydrological logic" – with Israelis exporting scarce fresh water in the form of produce to European markets.

The municipal and industrial sectors, to be sure were faced with higher, and often actual market prices. Indeed, cities were fined if their delivery systems and pipes had excessive leaks and watering lawns – whether in city parks or in backyard was considered a luxury, and charged accordingly. (Tal, 2006) But there was no attempt to create a market to allow prices to settle at their natural level. While cities were allowed to tax citizens for sewage treatment and infrastructure costs, these were rarely linked to actual treatment costs. Most importantly, the idea

of privatizing the water sector and creating competition between different water suppliers was considered an anathema in a Socialist economy.

The New, Competitive Age of Israeli Water Management

During the past decade, several fundamental changes have occurred which altered the traditional economic approach that characterized Israeli water management. To begin with, for the first time, private corporations began to produce water. It began with bottled “mineral water”, where private corporations paid for rights to access natural springs. From the Golan Heights, (the Eden Water Company) to the Judean Desert (Ein Gedi Kibbutz), conservationists were unhappy with the tapping of the limited natural springs that nature had previously supported local ecosystems. But with the support of Israel’s governmental Natural and Parks Authority, entrepreneurial ventures took advantage of the growing Israeli discomfort with water quality levels and the general international preference for the better tasting natural waters. Living far wealthier and consumeristic society, Israelis were happy to pay high prices (over one dollar a liter) for bottled water and the government merely took on the role of regulator, to ensure the quality of the product. (Mizroch, 2008)

A second move towards greater institutional competition in the production of water was the establishment of major reverse osmosis desalination plants. . On April 4, 2002 Israel’s government decided to build a series of four new desalination plants that should produce some 250 million cubic meters of water. This amount was recently doubled by a series of subsequent government decision. This constitutes an increase of over 30% in national water supply. Figure 2 shows the projected expansion of desalination facilities across Israel. The plants established under a BOT tender, are run by private corporations, typically with international partners. Such reliance on a private sector, much less non-Israeli players would have been unheard of even ten years ago.

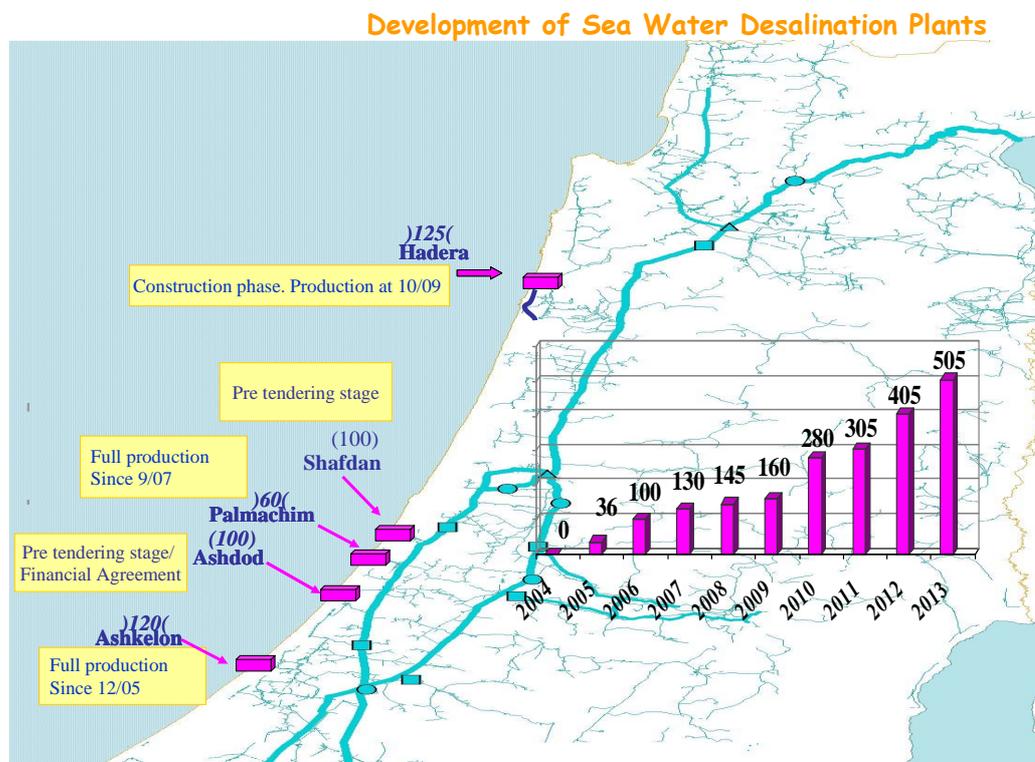


Figure 2: Source: Israel Water Authority, 2008

An additional institutional transformation is taking place in Israel in the area of municipal management of water and sewage. Based on the orientation of the British colonial mandate that ruled Palestine until 1948, city governments were given authority for providing water to citizens and collecting and treating their sewage. Unfortunately, this was not a government responsibility which most Israeli municipalities met effectively. Sewage treatment in particular was often neglected, despite local governments' enthusiastic collection of special surcharges for sewage treatment. There were always other more politically attractive things to do with the funds. Legislation by Israel's Knesset in 2001 changed this by creating local "Water and Sewage Corporations" which are to be run as economically independent public bodies. (Tal, 2007) The ostensible goal was to ensure that politicians not dip their hands into public funds and revenues that were designated for strengthening water infrastructure. The result in actual fact is to produce a new economic sector and political player which will probably become privatized at some point.

Water pricing has also undergone nothing short of a revolution. Where water was for many years subsidized intensively so that farmers paid only a fraction of their real costs, over a protracted period, these subsidies have been gradually reduced and indeed as of August 15, 2007 are do not exist at all. Table 1 shows a breakdown of present prices for water in Israel. Conservation of water is encouraged by providing base-line quantities at lower prices, and ratcheting the price up to different levels for water intensive operations or households. While agricultural users still pay less than do consumers in the city or in factories, government officials explain that this is a reflection of the lower actual costs of providing water to the farmers in Israel. This has much to do with lower demands for quality control, maintenance etc.

Table 1: Water Pricing – Israel 2008

	Domestic	Agricultural	Wastewater	Public Institutions
<u>1st Price</u>	0.72 €	0.24 €	0.11 €	1.08 €
<u>2nd Price</u>	0.88 €	0.29 €		
<u>3rd Price</u>	1.41 €	0.38 €		

*Source: Israel Water Authority, Economics Department, 2008*

Privatization? Yes -- Water Markets? Probably not!

Economic analysis will surely find certain inefficiencies in Israel's past and present water policies. Yet, in retrospect, Israel's historic approach can be considered to be a rational strategy which allowed the country to use water to promote other national objectives (e.g., immigrant absorption, settlement of the periphery, combating desertification, food security, etc.) rather than pursuing maximum economic efficiency. Israel's successful recent development of desalination facilities along with the establishment of water/sewage corporations has led to changes in the accepted norms of its traditional water development strategy. These include increased privatization of water production and supply as well as subsidy reduction and differential rate pricing for consumers.

Yet, it is unlikely that the country's traditional policy orientation towards markets will change dramatically. In terms of water allocations and usage, the country has reached impressive achievements without losing centralized control and leaving decisions about water prices and supply to the "invisible hand" of the market. Inefficiencies resulting from Israel's traditional policy, when compared to most other countries are relatively modest. Israeli water managers can take pride at having expanded water supply through increased treatment and reuse of waste water along with desalination and conservation, while maintaining a highly profitable agricultural sector. All this, notwithstanding the inhospitable climate, soils and water resources. The Israeli experience suggests that centralized, "top-down" regulation can produce extremely high levels of performance in water usage and management.

Moreover, recently, a backlash among the Israeli public has begun to oppose to a rash of proposed government "privatization" initiatives has begun. Functions that were supposed to have been delivered to the private sector (such as education, prisons and several security ones) are now seen as better provided by government monopolies that do not set profits as a paramount priority. While the nascent privatized water industry has not been the focus of such critiques, this is largely due to the effective oversight of Israel's Water Authority and other associated government ministries. It is unlikely that creating proper water markets would be politically popular, given the uncertain results and international experience, which is not necessarily impressive.

There are also geopolitical forces in play which influence present policies. Water promises to be a critical factor in future peace negotiations, as Palestinians and Jordanians face water scarcity levels which dwarf even Israel's per capita levels. There are those who support regional water markets as a way of depoliticizing this highly charged issue. Yet, it is unlikely that markets will be welcome as a mechanism for resolving conflicts between Palestinians and Israelis over water due to the desire of Palestinians to enjoy full sovereignty over water resources and Israel's aforementioned commitment to additional national objectives, beyond efficiency, in its utilization of water resources. (Hadad, 2007)

In conclusion, non-market, management strategies will probably continue to dominate Israeli water policy for the foreseeable future. Water pricing will be utilized very carefully by the government to promote national objectives, chief among these being water conservation and perhaps ecological restoration of streams. But agricultural productivity, when it is encouraged through government policies, will *not* be attained through water pricing. Even as Israel's water system will continue to integrate private sector players, creating proper water markets seems unlikely. Considering the generally successful record of water quantity management in Israel, such innovations are also probably unnecessary. As the adage goes: "If it's not broken – don't try to fix it". And despite a temporary crisis created by four consecutive drought years, Israel's water management is hardly broken, but cautiously evolving to meet ever changing challenges.

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