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Water Pricing in Israel in Theory and Practice

Yoav Kislev

Introduction

Throughout the world, water prices reflect local laws and institutions for water delivery. Some places, such as Israel, manage and price water in a largely centralized way, others, such as Arizona, approach management and pricing in a more decentralized manner. This chapter reviews water management and regulation in Israel, presents basic theoretical elements, and surveys the practice of water pricing in Israel. The discussion points out the challenges associated with pricing water to reflect its scarcity in these growing, water-short regions.

The Water Sector

The particular characteristics of the water sector in Israel affect its pricing policy: water in natural sources is scarce and a single water system supplies most of the users in urban centers and agriculture. This chapter presents the basic economic approach to water pricing and surveys the application of the principles in the real world. It starts with a short description of the water sector and its institutions.

Table 1: Water Provision, 2008, Million Cubic Meters

	Agriculture	Industry	Urban	Others	Total
Freshwater	491	89	755	100	1435
Recycled	399		1		400
Brackish	189	32	3		224
Floodwater	43				43
Total	**1122**	**121**	**759**	**100**	**2102**

Source: Water Authority.
Notes: Of the freshwater, 153 MCM (million cubic meters) were supplied from desalinated seawater and 24 MCM were desalinated brackish water, mostly in the southern tip of the country. The category “Others” includes transfers to the Kingdom of Jordan (45 MCM) and areas of the Palestinian Authority.

Israel is a small and narrow country (Figure 1); half of its area is a desert. Precipitation, which falls only in the winter months, averages more than 700 mm per year in the north and less than 35 mm in the southern tip of the country. The core functions of the water sector have been to store water from winter for use in the summer and from rainy years to dry ones, and to carry water from the north to the center and the south. Two sources have been added recently to the country's water supply: When population expanded and urbanization grew, treated and recycled sewage was added to supply, mostly for use in agriculture, but with smaller amounts also allocated to natural habitats. More recently, desalinated seawater has become a significant source of water. Table 1 presents information, for 2008, on sources and users of water.

Fresh water is stored in the Sea of Galilee (Lake Kinneret in Hebrew, labeled “Lake Tiberias” in Figure 1) in the north and in several groundwater reservoirs; the largest two are the Mountain Aquifer and the Coastal Aquifer. The Mountain Aquifer is located mostly under the West Bank from a point south of Nazareth to Beer Sheva (political borders are marked in Figure 1 by broken dotted lines). The Coastal Aquifer stretches along the Mediterranean from a point south of Haifa to Gaza. The National Water Project (Carrier) is a system of conduits running west and south from the Sea of Galilee and connecting most of the sources and users of water in the country in a single grid. Two thirds of the water in Israel is supplied by the largest, government owned utility, Mekorot Co. The company also operates the National Project. The other suppliers are private well owners, municipalities, and regional cooperatives. Municipalities are required to collect and treat their sewage and several cities have cooperative projects with agricultural interests in their vicinity. The metropolitan area of Tel Aviv, where the majority of the population is concentrated, supplies recycled water to the western Negev.

The last several years were particularly dry, since 2005 reservoirs' recharge has been lower than average, water was in short supply and farmers and households were called to reduce consumption. These developments—and the worry that they may have heralded a lasting climate change—hastened the construction of seawater desalination plants along the Mediterranean coast. Three relatively large plants are already operating and provide close to 300 MCM of water to the national grid. A fourth plant is under construction and a fifth is in advanced planning stages. Trying to avoid the concentration of economic power in Mekorot, the first four plants were constructed and will be operated by private interests. Only the fifth desalination plant is scheduled to be built by a subsidiary of the national water company.

Institutions and Regulation

As natural resources, the water reservoirs are common pool resources. Under open access individuals tend to behave as free riders: that is, they withdraw water so long as it is beneficial for their own use disregarding the detrimental effect that their extraction has on other users of the reservoirs (for example, by lowering water levels or drawing in saline ocean water). Under such circumstances, the resource will be depleted. In addition, in Israel suppliers are monopolies, particularly Mekorot. (Actually they are local monopolies, each in its area of supply.) These features call for government intervention. Accordingly, the Water Law (1959) stipulates that all water sources in the country are publicly owned; there is no private ownership of water. A government agency is responsible for the utilization and the sustainability of the resources. The law requires measurement of all uses of water. This means that wells and pumps are monitored and consumers—households, manufacturers, farmers, and others—pay by the volume of water they use.

Two far-reaching reforms took place in the water economy in the last ten years. One was the removal of urban water provision from the control of municipal governments and the other was a restructuring of the sector's regulatory body.

Water and Wastewater Corporations

In the past, municipalities were responsible for water and wastewater services in their areas of jurisdiction. A great share of the water supplied in urban areas was purchased from Mekorot and smaller shares came from wells owned and operated by the cities themselves. The municipalities collected one-time connection fees to cover capital outlays in water and sewage systems and bimonthly charges for their operating costs. Activities in water and wastewater were integrated with all other local services and it was often convenient to neglect the expensive maintenance of the water systems and to divert money collected for water to seemingly more urgent needs. The results were infrastructure breakage, interruption of supply, and leakage—particularly of sewage.

To amend this situation, the responsibility for the provision of water and wastewater services in urban areas was shifted from the local governments to new independent corporations. The new entities were and, in many cases, still are owned by the municipalities, but they may eventually be transferred to private hands. The law establishing the new entities was passed in 2001, but, despite the encouragement of the national government, the reform has been gradual, and is still not complete as of August 2010. Significant improvements in the services were recorded in several of the cities in which the new corporations took over. However, difficulties should also be expected, particularly in socially and economically weak localities where management will not be efficient and customers' payments will seldom cover cost. These problems will have to be solved in the coming years.

The Water Authority

Although Mekorot is regarded as the national water company, it is not the only water provider. There is thus no single utility enterprise that can be seen as responsible for water and wastewater services in the country. As a result, the government cannot limit its role to conventional economic regulation, such as done, for example, by The Water Services Regulation Authority in England and Wales (Ofwat, 2010). In Israel, apart from being the economic regulator, the government is also involved in management and long run planning of the water economy. These duties affect the structure and the activities of the agency in charge of the sector.

The original 1959 Water Law entrusted the management and regulation of the water economy to a single individual, the Water Commissioner. He was assisted by the staff of the Water Commission, a government agency comprising two professional departments—Hydrology and Planning—and an administrative body responsible for the allocation and overseeing of withdrawal permits, allotments in agriculture and industry, and the promotion of development of the sector including, recently, the desalination plants.

The law gave the Commissioner a wide range of powers,; however, it also left many dimensions of the water sector to the responsibility of others. For example, the Ministry of Agriculture allocated quotas to farmers; municipalities, including their water services, were controlled by the Ministry of the Interior; and the Treasury set prices, but parliamentary committees were also often active in the determination of water tariffs. The multiplicity of participants in decisions on water issues was seen as detrimental to efficient management of the sector and, when difficulties in reforming urban water economies were encountered, the government proposed to modify the Water Law and restructure the underlying institutional setting.

A new law, which went into effect in 2007, abolished the position of the Commissioner and established a Governmental Authority for Water and Sewage headed by a Director. It also established a Council of the Water Authority, whose members are the Director of the Authority, officials from several government ministries, and two members to act as representatives of the public (appointed by ministers). The Authority, with its Director, can be seen as the executive branch of the water regulation body, while the Council acts as its legislative branch. The Council decides on water allocation and tariffs and is expected to assist the director in executing government's policy in the water sector.

The new, reformed law expanded significantly the area of responsibility of the new regulatory body. Table 2 clarifies this division of responsibility. In the table, the resources are the water reservoirs, and they—including those exploited by urban providers—belong to the national water economy. The desalination plants can be seen as part of the resources or, and perhaps better, as outside suppliers from which the water sector purchases inputs. The economic row in the table stands for economic and business regulation: Mekorot in the national economy and the city corporations in the urban sector.

Table 2: Areas of responsibility in the water economy

	National economy	Urban sector
Resources	+	
Economic	+	+

In his time, the Water Commissioner was responsible only for the regulation of the resources and their utilization. He permitted water withdrawal and controlled its allocation. He also promoted new projects and development. His involvement in price setting was minimal. This has changed; the Water Authority is now responsible for all three marked cells in Table 2. The formerly independent regulator of the urban corporations was absorbed in the new Authority and it (its Council) was also given the duty and power to decide on tariffs. As the economic regulator, it also oversees investments in Mekorot and the urban corporations.

In addition to its responsibility for the water sector in Israel, the Authority is also in charge of supplying water, according to treaties, to areas of the Palestinian Authority and the Kingdom of Jordan. Israel has been criticized for blocking the access of Palestinians to water sources. The Water Authority rightfully claims that it is not only honoring the signed agreement (Oslo Treaty) but providing more than the stipulated supply (Water Authority, 2009). Others think that, in this case, adhering to the written letter is not enough (Kislev, 2008): it is the duty of the government of Israel, responsible for the Palestinian areas, to provide the local population with water services similar to the services that households in Israel enjoy.

Two allocation problems
There are two major allocation problems in water: a. allocation of extraction: where, when and how much to withdraw; b. allocation of water for utilization and consumption. The two problems are distinct, although the Israeli law obscures the distinction.

The criterion for extraction of water is sustainability of the resource. The role of the Water Authority is to guard the long run stability of the quantity and quality of the nation's water resources. Fulfilling this role may require decisions on each source and well separately, depending on local hydro-geological circumstances. Accordingly, the law specifies that water may be withdrawn only under an extraction permit issued by the Authority. The criterion for the allocation of water for consumption and utilization is efficiency; that is, the maximization of economic welfare from the use of water. The discussion turns now to basic economic principles of water allocation.

Water Pricing: A Theoretical Framework

The next four subsections present, by example, the basic theoretical framework for water pricing and allocation. They will be followed by surveys of cost and water tariffs in Israel.

Allocation of water from a single spring
Consider a region with a single spring irrigating the fields of two farms. The water flows to the fields on its own with no need for energy or labor. The water yield of the spring, the annual quantity, is limited. A regional planner attempts to maximize the "national income" of the region, the sum of income in the farms. Water allocation that achieves this goal is depicted in Figure 2: the total yield of the spring, the quantity **c**, is divided such that the value of the marginal product (VMP) of water in the fields of farm A is identical to the corresponding value in farm B. (The curve D is the vertical sum of the VMP curves in the individual farms.)

The following discussion will deal with methods of allocation. The discussion relates to methods applicable for a large number of water users and the reference to two farms is used only to exemplify the principles. In places where the number of users is actually small—for example, in water cooperatives—the arguments may be modified.

One may think of three distinct methods of allocation.
1. Allocation by quotas: farm A will receive **a** CM (cubic meters) of water per year, farm B will receive **b** CM;
2. Allocation by prices: with the price **p** farmer A will take **a** CM per year and farmer B will take **b** CM;
3. A market: the initial allocation will be arbitrary (but not more than the total available in the spring, **c**) and the farmers will trade the water. The one who received more water, relative to the VMP on the farm, will sell; the other farmer will buy.

With quota allocation the planner has to know exactly the VMP schedule on each and every farm. Where allocation is by prices, the planner has to know only the market-clearing price. This price can be discovered by trial and error. If the price is set too high, there will be under-utilization of the spring's water and income will not be maximized. The price will then be lowered. Prices have an additional advantage over quotas: they are not personal; they do not allow discrimination; and they constrain the rule of bureaucracy.

In principle, market allocation (item 3) may be as efficient as allocation by prices. But the initial allocation of the water is an allocation of wealth. This raises policy questions regarding how it should be determined. Where property rights in water were determined in the past and are by now a given fact, the creation of a water market is a solution for efficient allocation. Where water is a common resource, the property of the public at large, price allocation is more appropriate.

Scarcity value, price, and extraction levy

Given that the total yearly quantity of water is **c** CM, if water use in farm A is expanded by one CM, allocation in farm B will be reduced by one CM. The reduction in production on farm B will then be the cost of water use on farm A. Symmetrically, the cost of water added on farm B is reduced production on A. This cost is an opportunity cost—the loss of output in an alternative allocation of water. Cost in economics is always opportunity cost: the cost of energy in water transportation is an opportunity cost and so also the cost of labor on the farm, since energy and labor utilized on one farm are not used on another and do not contribute there to production. For convenience, despite all costs being opportunity costs, we shall term cost incurred by conventional inputs "cost of purchased factors." Among the purchased factors are all the inputs, including labor and capital – only water in its sources is treated separately.

In the example of the spring presented above, in which the water flows on its own to the fields of farms A and B, the opportunity cost is also the scarcity value of the water (the marginal scarcity cost). A scarcity value emerges because of water being constrained by nature to the quantity **c.** As this is less than the combined demand for the resource, the water is scarce. With a larger yield of water in the spring, scarcity cost is smaller; where water yield is very large, relative to its value in production, scarcity cost is zero.

In Figure 2, if allocation is by prices, the price **p** in money units per CM is the scarcity price. Deduction of one CM from the spring's water will reduce output by an amount the value of which is **p**. Sometimes this price is also termed the social cost because the reduction of output is a reduction in the product of the society (farms A and B are both parts of the society). The price **p** is set in some places as the extraction levy or the pumping tax. It transmits to water users the scarcity cost of water and they, the users, may decide on their own how much water to take. A social planner does not know in detail the contribution of water on the farms and there is no need for him to be involved in on-farm decisions. With the right price, the farmers will take the right quantities, they take the social cost into their own private consideration; they internalize it.

The question now arises, with price allocation the farmers will pay **p** dollars per CM, whom will they pay in a region that enjoys the benefit of the spring water? If the water belongs to the public, the payment for the water also belongs to the public. In such a case the payment will be to the government's budget, to the fisc. The objection often heard of money going to the government instead of to the public (the "people") is meaningless in a democracy, as the budget of the government is the budget of the public at large.

It is worth observing that the opportunity cost, and any other concept of cost, is meaningful only when water allocation is optimal—when income is maximized—as in the diagram. If, as an example, allocation in the region is arbitrary and farm A received more water than in Figure 2 and farm B received less, the concept of opportunity cost is empty since it is possible, with an alternative allocation, to increase output at no cost and without adding water to the region.

Purchased inputs

The analysis is now modified. Assume that cost of water supply is not zero but MC1 as in Figure 3. The symbol MC was chosen to emphasize marginal cost (when marginal cost is constant, as in Figure 3, it is equal to the average cost). MC1 is the cost of the purchased inputs. The introduction of purchased inputs has, however, not modified the appropriate price of water, it is still **p**. But now the scarcity cost (the efficient extraction levy, if applied) is **p**-MC1. The general definition is: the marginal scarcity cost is the opportunity cost (value of marginal productivity) minus the cost of purchased inputs, provided the difference is positive. If the difference is negative, the scarcity cost is zero. Thus in Figure 3, if the cost of purchased inputs is MC2, the farmers will not take all the spring's water and the scarcity cost will be zero.

Withdrawal from a reservoir

The total quantity of water in the Coastal aquifer in Israel is estimated to be 20 billion CM, annual withdrawal (safe yield, sustainable withdrawal) is roughly 300 million CM per year; that is, less than 2% of the stock. Annual safe yield is determined by annual recharge. Once the safe yield is set, it should be taken as the annual yield of the spring water was taken—a constant magnitude. (Replenishment fluctuates widely. Safe yield for a stable supply will therefore be less than average yearly replenishment.) If demand is relatively high, water is scarce, the allocation problem is identical to the problem depicted in Figure 3. If priced efficiently, the water from the reservoir will be priced according to the opportunity cost, which is the sum of the cost of purchased inputs and scarcity cost.

It is often stated that the scarcity cost of water is determined by the tradeoff between generations. This is true where water is "mined", where withdrawal exceeds replenishment and the quantity in the reservoir is depleted. Water used in this generation reduces the amount that will be available to the next. This, however, is not the case where withdrawal is limited to the safe yield, in which case scarcity value is not affected by intergenerational considerations. (An exception related to the quality of water is here disregarded.)

It should be noted that, for simplicity, the discussion is conducted in ideal terms, assuming that the same quantity of water will be supplied year in and year out and the corresponding price will also be kept constant over-time. This price will be set such that all (safe yield) water will be taken and used efficiently. It is often stated that the function of the price is to conserve or save water. This is not accurate. The primarily role of setting an economically optimal price is to direct producers (and consumers) to utilize water efficiently. If the price is set comparatively high, to reduce water use, income (welfare) will be reduced. As an example, examine Figure 3; if a price equal to MC2 is set, when the cost of purchased inputs is MC1, the total quantity used will be smaller than **c** and some of the spring's water will not be taken. Its value will be wasted. So also in a reservoir such as the Coastal Aquifer in which water flows to the sea, a price set too high will cause too much water to be drained to the sea. This is a waste. A price that saves water, over and above its efficient use, causes waste. The purpose of prices is not to save water but to inform the users about the marginal social cost of the resource.

The evolution of water costs in Israel

Figure 4 depicts the major features of the evolution of cost in the water economy of Israel. The horizontal axis traces the development of the water economy; both its technical expansion—from local withdrawals to distance supply, and then to seawater desalination—and historically, from the establishing of the State to the present and to future expected developments.

As seen in Figure 4, the cost of local production is 0.12 US dollars per CM, while the cost of water supplied by the national project is $0.35. Desalinated seawater costs $0.60 per CM. These are the costs of purchased inputs. Where is scarcity cost? This cost varies along the X axis; that is, through time. Examine, as an example, the situation in 1970 (the demand curve marked 1970 represents approximately the situation in that year). There is local withdrawal in the Coastal region and, in addition, water is moved from Lake Kinneret southward. A simple way to calculate the scarcity value of the water in the Coastal aquifer is to compute the difference between the cost of water brought by the National Project and that of local production; that is, $0.23 per CM (0.35-0.12). This calculation is based on the assumption of an equilibrium prevailing in the coastal region: the users of water in the region pay $0.35 per CM and this is also the VMP on their farms. Therefore, the opportunity cost (total cost) is $0.35 per CM and the scarcity cost, as seen above, is the total cost minus the cost of purchased inputs. This magnitude, $0.23 per CM will therefore be the efficient extraction levy in the Coastal aquifer.

What is the scarcity cost in Lake Kinneret? Let’s start with 1970; by the assumption underlying Figure 4, we have not made use in this year of all the available water. The situation in the lake was then like the situation depicted in Figure 3 with purchased cost MC2, the scarcity cost of the lake’s water was then zero. It will be $0.25 per CM in 2015 (60-35).

Prices and levies

There are three major sets of water prices in Israel: prices for fresh and recycled water supplied by Mekorot, prices charged in the urban sector, prices charged by "private" suppliers—mostly regional cooperatives. In addition, payments are collected for sewage services and extraction levies are imposed on water withdrawn from the reservoirs—Lake Kinneret and the aquifers. The private entities charge to cover their cost. Tariffs for Mekorot and urban water are set administratively. In the past, these prices did not necessarily cover costs. Their determination was somewhat arbitrary, influenced by political considerations. Gaps between cost and revenue were covered for Mekorot by the state budget and in the urban sector from municipal sources (or surpluses in the water account were added to the general revenue of the municipalities). Today total cost of water and sewage services, in Mekorot and the urban corporations, is covered by prices collected from users. Details are presented below.

It should be noticed, that although the principle of cost recovery is maintained in water provision, there still exists substantial government support in the sector. The state budget finances investment in recycling projects, in new urban corporations, in sewage systems in poor localities, and more. These aspects of the water economy are however not covered in this chapter.

Prices in agriculture

Freshwater

The prices farmers pay to Mekorot for freshwater are of increasing block rate. Each agricultural consumer is allotted a quota and, as of 2010, the prices are (calculated at the exchange rate of NIS 3.80 per $1.00):

First block, 50% of the quota	$ 0.36 per CM
Second block, next 30%	0.42
Third Block	0.55

The quotas were set many years ago and they have not changed much since. In dry years, farmers may be limited to take only part of the quota, but the price structure does not change. A "water consumer" in agriculture is a private farmer, a kibbutz (communal village), or a moshav (cooperative village). In the last case, individual operators in the cooperative are not constrained privately by quotas, the coop may distribute the Moshav's allotment and charge the members as it sees fit.

By an agreement between the government and representatives of the farmers, water prices will gradually rise until they reach average cost of supply including the cost of purchased desalinated water. It is expected that by 2015 prices will be 50% higher than today.

Recycled effluent

Treated urban sewage is mostly used in agriculture. Mekorot operates two large recycling plants, near Tel Aviv and near Haifa, and several smaller facilities. All others are owned and run by local operators, mostly regional agricultural cooperatives. Mekorot's price for recycled effluent is $ 0.21 per CM. The construction of private facilities is subsidized, aiming to set cost equal to Mekorot's charges. (The idea is that individual farmers will pay the same price whether their effluent is provided by Mekorot or by a regional cooperative.)

Extraction levies

The prices farmer pay Mekorot are the same throughout the country. Consequently, the cost of water to well owners and those pumping directly from rivers or Lake Kinneret may be significantly lower than to their neighbors who receive water from the national system. To ameliorate this situation, in the past the government operated an Equalization Fund: low cost water users paid into the fund and high cost users were on the receiving end. In fact, most of the payment went to Mekorot; since the company supplied to remote and hilly areas. This policy was modified ten years ago. Extraction levies replaced payments to the Equalization Fund. In principle, extraction levies are to be set equal to scarcity rents and they may vary according to locality and source of water. In reality, the levies are not always set as pure economic theory would dictate. However, they do differ geographically and by sector, they also vary by quantity, season, and precipitation.

Farmers in the coastal area who withdraw aquifer water pay block rate levies:

First block, 25% of the withdrawal license	$ 0.02 per CM
Second block, additional 55%	0.27
Third block	0.41

Farmers in other areas, particularly farmers who draw their water from rivers and Lake Kinneret, pay much lower rates. Some of these are higher in dry years and lower in rainy times.

The urban sector

Much of the work of the Water Authority in the last couple of years has been on tariffs for the urban water and wastewater corporations. By law these tariffs have to cover cost and the original intention of the Authority was to set locality-specific prices to reflect local cost. These intentions, published in preparation for public hearing before the Council of the Water Authority, encountered harsh criticism in the media and strong opposition in political circles. Accepting the criticism, the new price schedules set for the urban corporations in 2010 are identical, the same prices for each and every corporation. Customers in municipalities that have as yet not transferred their water services to independent corporations, pay similar rates.

Like farmers, households pay corporations block-rate tariffs. The first block is for a "basic quantity" of 2.5 MC per person per month (5 CM in a single person household). The second block is for additional amounts.

Basic quantity	$2.27 per CM
Additional amount	$3.85 per CM

Most offices and institutions pay only the higher rate. These rates cover both water and sewage services and they include a 16% value added tax.

As indicated, internal costs of water and wastewater services in the corporations vary markedly, but customers pay identical prices. To have the corporations cover just costs, not making profits or suffering losses, Mekorot prices for bulk quantities, at the city gate, are set differentially. While detailed numbers were not published, I calculated that the payments to Mekorot range from $0.47 to $1.05 per CM. Low cost corporations pay Mekorot per unit of water more than others.

Two items on the tariff schedules have not been finalized as this summary is written (August 2010): Charges for capital outlays and extraction levies.

As indicated, municipalities collected from homes and buildings one-time connection levies to cover investment in water and sewage infrastructure. The Water Authority Council attempted to replace these levies with a capital outlay component in the price per CM. The municipal water corporations protested, arguing that they will lack funds for new developments, and, following heated debates, the Council postponed the implementation of idea for one year. The inclusion of capital outlays in the price of water, if accepted, will add $0.21 per CM to the rates quoted above. Households currently served by the corporations, those who had paid the levy when they were connected, will be exempt from the payment for 14 years.

Fifteen percent of the water provided in the urban sector is withdrawn from wells owned by municipalities or by the water corporations. When deciding on new prices, the Water Authority Council set extraction levies for locally withdrawn water so that its cost is similar to the cost of water purchased by the corporations from Mekorot. By law the levies, considered as taxes, have to be approved by a parliamentary committee. They have not been approved to date.

These two delays are indications of the difficulties the Water Authority and its Council face and can be expected to face as they attempt to implement the restructuring of the urban water sector.

Cross-subsidization

Prices households paid in the past for water supplied by municipalities were also of the block rate schedule. Large families received larger allotments at the lower rate. Since many of the large families were also poor, richer and smaller households supported poorer and larger ones. This was internal municipal cross subsidization. A problem with this kind of support is that some cities are inhabited mostly by poor and large families while the population in others constitutes mostly well to do and small families. Consequently, the few relatively "rich" of the poor towns supported their poor neighbors while the real rich of the better situated cities supported the few poor families residing among them. The shift to independent corporations brought this problem to light and its recognition was behind the suggestion of the Water Authority to set locality specific prices for Mekorot water. In other words, locality specific prices will prevail even when (and if) all corporations reach the same level of efficiency and have identical internal costs. (The complicated price structure could be avoided if tariffs were not set at block rates and only one price was charged. But this simple solution was politically unacceptable.)

In the past, the prices Mekorot charged did not cover the cost of provision and the government supported the company regularly from state budgets. Now, the tariffs are set so that the total payment the company collects covers all its costs (Mekorot is not charged extraction levies). In fact, urban consumers cover part of the cost of supplying water to agriculture. The Water Authority estimates that this cross subsidization element adds $0.24 per CM to urban water price. When farm prices rise in the coming years, as agreed, urban prices may be lowered. Once this is done, water prices to the agricultural sector will not be supported any more. However, as in the urban sector, farm prices are and will be cross-subsidized internally: Mekorot charges identical prices from all users in agriculture and farmers in low cost areas support water provision to their high cost colleagues.

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Figure 1: **A Map of Israel and the National Project**
Source: Kliot, Nurit, **Water Resources and Conflicts in the Middle East**, Routledge, 1994

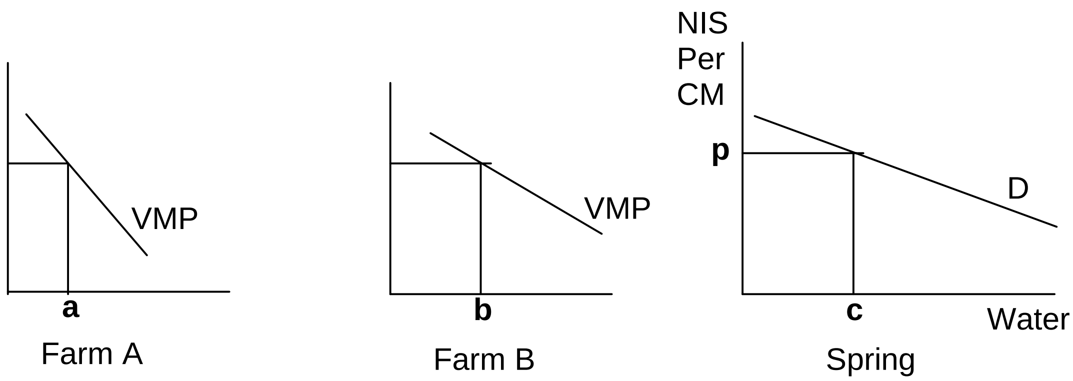

Figure 2: **Water from a spring**

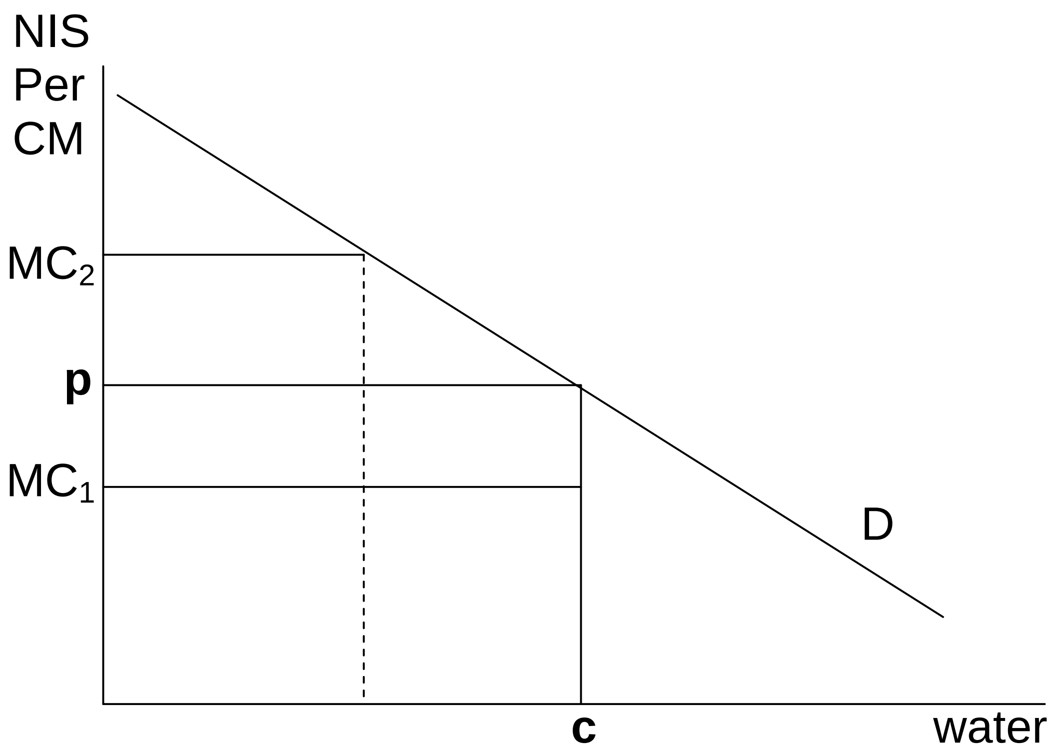

Figure 3: **Supply of water from a spring with purchased inputs**

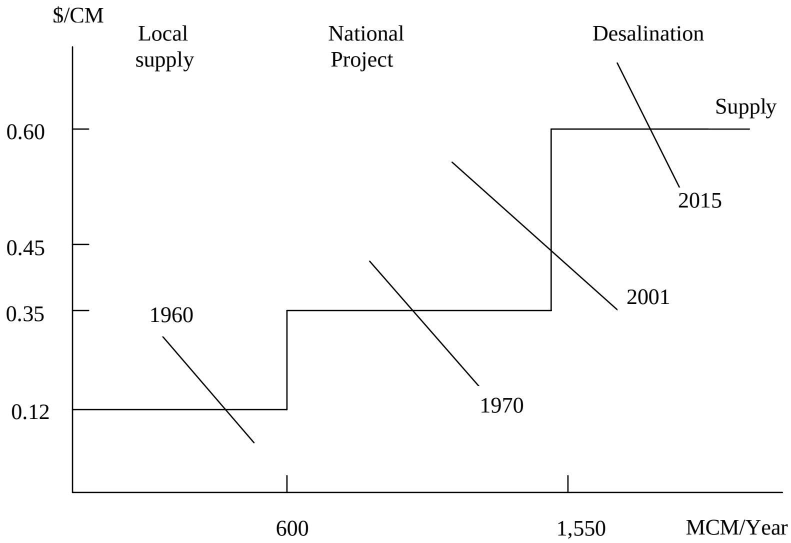

Figure 4: **Three epochs in the water economy**

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