URBAN WATER SUPPLY, POLICY AND PRICING A CASE STUDY OF TEL AVIV - JAFFA[1]

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1 INTRODUCTION

The continuing rapid growth of the urban population in Israel has been one of the major challenges of Israeli politics and economics since its foundation. A sheer magnitude of environmental problems especially in the water sector are associated with urbanization. Water pricing is an increasingly common tool, applied to recover costs, to give the right incentives to water users, and to protect the environment. In practice, there is a great variety in type, level and structure of tariff systems not always meeting the needs of a sustainable water management. Therefore the paper will hopefully explain the complexity of water supply and water pricing issues as well while giving sufficient background information and justifications of the present situation of the urban area Tel Aviv – Jaffa.

2 URBAN DEMOGRAPHIC TRENDS

Following the general demographic trend in the world also Israel's population is on the way to being transformed into urban dwellers. The population of Tel Aviv-Jaffa is growing although the government has set up a policy to settle new immigrants in areas outside the Metropolitan area of Tel Aviv – Jaffa, the Greater DAN region. Reasons for this intensive growth in population can be found in the massive emigration of Jews to Israel, a high natural population growth[2], massive industrialization and business growth. In 2000 358,800 people were living in Tel Aviv-Jaffa, approx. 5.6% of the national population. According to the actual Master Plan of Tel Aviv-Jaffa the population will grow from about 350,000 today to 500.000 in the year 2020. Approx. 100,000-300,000 mostly illegal immigrant workers live and work in Tel Aviv-Jaffa. They have to be added to the official population data of the city and must be taken into account in water supply planning as well.[vi]

3 WATER RESOURCES

Every municipality in Israel can obtain any amount of water it wants to get from the national supplier MEKOROT via the National Water Carrier. Therefore, to assess urban water resources, national water resources have to be taken into account.

3.1 The national Water Resources

The two main types of water resources available to Israel and its Arab neighbors are: groundwater, contained in aquifers and surface waters in rivers and streams. As far as groundwater is concerned there are two major aquifers: These are the Mountain Aquifer and the Costal Aquifer. The Mountain Aquifer underlies the West Bank and extends beneath the 1949

[1] Facts and information presented in the paper are collected mainly from official Israeli resources as objectively as possible by a number of intensive semi-structured interviews with specialists from the Israeli Water Commission, the Water and Wastewater Department of the Municipality of Tel Aviv- Jaffa, the Municipal Water Works Administration, MEKOROT and the Israeli science community.

[2] In 2000 the annual growth of population in Tel Aviv-Jaffa accounted for 1%

Armistice Line – Green Line- into Israel. The Costal Aquifer underlies the costal plain of Israel and the Gaza Strip. Both aquifers are shared by Israeli and Palestinian. The surface water resources shared by Israel and its neighbors consist essentially of the basin of the River Jordan, including its tributaries: The Sea of Galilee, the Yarmuk and the lower Jordan River.

There is a long history of different data and information regarding the average water potential[3] of water in Israel between experts within Israel, experts from the Palestinian Territories and third party experts. Recently actual data differ from 1,550-1,920 mcm[4]/year depending on Israeli sources. Table 1 shows the scenario for water potential in Israel in the coming decade offered in the Master Plan (transition) which was presented by the Water Commission in April 2002 based on figures of the last decade and an annual average of 1,531 mcm or this period.[ii]

Table 1: A basic Scenario of sweet Water Balances in the national System for the coming Decade, based on the Data of the last Decade (mcm) The Data presented are only one possible Scenario for the Future reflecting the actual Supply oriented Policy of the Israeli Water Sector.

Year/source	2002	2003	2004	2005	2006	2007	2008	2009	2010
Natural Enrichment[5]	1,153	1,693	1,024	1,528	1,203	1,209	1,224	574	941
Seawater desalination	0	0	420	440	460	480	500	520	540
Brackish water Desalination	10	10	20	30	40	50	50	50	50
Exploitation of Reserves	0	0	0	0	0	0	0	0	0
Total sources	1,163	1,703	1,464	1,998	1,703	1,739	1,774	1,144	1,532

3.2 Water Consumption in Israel: The last Decade and the Present

Due to the large population growth, almost constant economic growth and a remarkable increase in living standard, the demand of water has kept growing during the last decades and is still raising.[i] The following figure shows the extraction of natural water resource in relation to the annual average recharge as well.

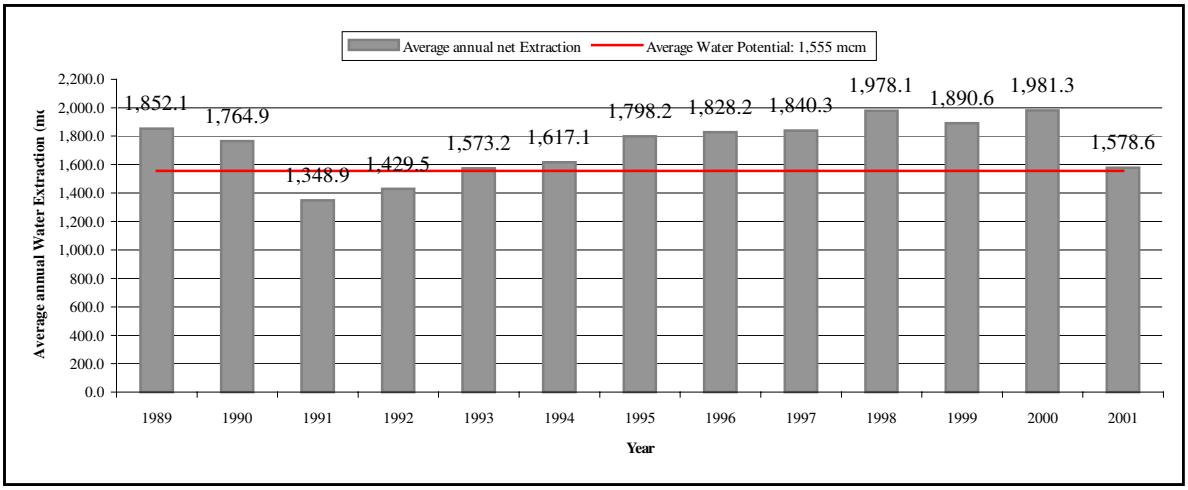

Figure 1: Average annual Extraction of natural Water in Relation to Recharge of natural Water (net of artificial Recharge, e.g. Shafdan Water)[ii], [iii]

[3] Quantity of water that may be produced on a multi-annual average without damaging the sources of water
[4] mcm – million cubic meter
[5] Less overflows and flowing into the sea

Given an average water potential[6] of 1,555mcm/year based on historic data as figured out by the Water Commission [ii] the figure above shows clearly that much more natural water is used than water is naturally recharged. Damaging the natural water resources, e.g. seawater intrusion and pollution of aquifers is following this overuse of natural water resources. Recently up to 2 bcm[7] of cumulative deficit of water of the last decades are under discussion due to the overexploitation of the natural water resources. Only in the hydrological year 2000/2001 approx. 300 mcm/year were served through overexploitation.[iv]

3.3 Estimated Water Demand in Israel for the next Decade

As shown in Table the Water Commission presented a quite optimistic scenario for the coming decade in its actual report. In the scenario it wishes to reach a state of balance by the year 2010. The scenario shows a remarkable reduction of water uses for agricultural purposes which is questionable due to the political power of the agricultural lobby. As a result of the economical growth and the growth of population the water demand is expected to rise during the next decade.

Table 2: The Demand for sweet Water in Israel in the coming Decade (mcm/year)[v]

Year/ Sector	Agriculture	Urban*	Industry	Nature and Landscape	Total Israel (Source: natural, desalinated)	Total Israel (natural, desalinated. brackish and effluents)	Total sweet Water Israel, Jordanians and Palestinians[8]
2002	582	700	99	25	1,406	1,834	1,503
2003	577	700	100	28	1,406	1,880	1,505
2004	544	763	102	31	1,440	1,952	1,542
2005	541	800	103	34	1,460	1,995	1,565
2006	538	815	105	38	1,480	2,023	1,587
2007	535	830	106	41	1,501	2,060	1,610
2008	533	845	108	44	1,523	2,097	1,634
2009	531	860	109	47	1,545	2,135	1,658
2010	530	875	110	50	1,568	2,173	1,683

3.4 Analysis of Demand and Supply of Urban Water: Tel Aviv – Jaffa and the Greater Dan Region

About 95% of the water of Tel Aviv – Jaffa is supplied by the Rosh Ha'Ayin springs via National Water Carrier, the Yarkon-Negev West Conduit and the Yarkon-Negev pipeline operated by MEKOROT. The remaining 5% are served by wells operated by the municipality. Coming from the National Water Carrier the water is delivered to the Zahala reservoir: a water reservoir in the north-east of the city composed of two 10,000 cm[9] tanks. The southern area of the city is supplied from the Arlozoroff reservoir in the east of the city with a capacity of 25,000cm. The reservoirs have an average elevation of 68.5m providing the pressure to deliver the water to most of the areas of the city. Remaining areas are supplied via pumping stations. Water served to the reservoirs is metered. The water pipe system inside the city, mainly constructed in the 1950's, has a length of 923 km. The water delivered to the reservoirs is not treated directly by the municipality itself, but is maintained upstream by MEKOROT.

[6] without desalinated water and recycled water, net of water the Israeli have to serve to Jordan and the Palestinians based on agreements

[7] bcm – billion cubic meter

[8] Only of sweet water supplied by Israel to the Palestinian and to Jordan and water which the Palestinians pump from the Western Aquifer, relying on Israeli data resources

[9] cm – cubic meter

Therefore, water quality problems resulting from the long detention periods in the pipe system and low flow velocities can not be influenced by the municipality itself, but it has to deal with the resulting problems.

As shown in the following figure the water supply has increased significantly over the last decade with an increased supply by city wells. Owing to the water shortage in the region during the last years, the Water Commission allowed water to be pumped from the wells inside the city border belonging to the Coastal Aquifer even though the aquifer is extremely overexploited, polluted and partly saline because of seawater intrusion. In the year 2000, leakages and non authorized consumption resulted in approx. losses of 11.9 %.[vii]

In the year 2000, 196,319 customers were registered supplying 32,115 buildings: 163,397 customers for residential use, 29,088 for industrial/agricultural use and 3,353 for public/institutional use. According to the water law all registered customers are metered.[vii]

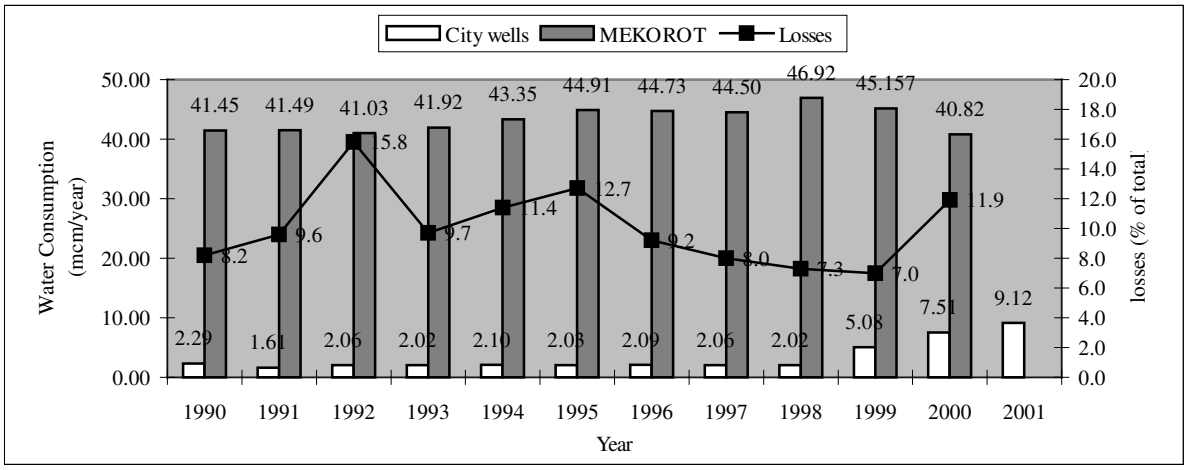

Figure 2: Water Supply by MEKOROT and City wells via the urban Water Network, 1990-2000 [**vi**],[**vii**, Year 2000]

Only approx. 75 % of the water meters are apartment meters. Since Increased Block Rates are in use, it is necessary to raise this number. Every single apartment should have its own apartment meter. Still a high number of multi apartment houses has only a house meter not distinguishing between the different users. The reading and billing frequency amounts to 6 times a year. A change to a monthly billing frequency could increase the awareness of customers about their water consumption behavior in order to save water, but would also increase the expenses of the water utility.

The supply network of Tel Aviv - Jaffa today is asked to meet the need of about 350,000 inhabitants and some 700,000 commuters working in the city or coming as a tourists daily. All water for institutional, public, commercial and industrial purposes has to be added. Following the overall water policy of Israel the actual urban water policy of Tel Aviv-Jaffa is supply oriented, too.

Table 3: Urban Water Consumption per administrative Sector of Tel Aviv-Jaffa 1997-2001 (mcm/ year)[vii]

Year	1997	1998	1999	2000	2001
Residential	**25.88**	**26.72**	**26.48**	**25.40**	**26.08**
Public/ Institutional without Public Gardens	6.50	7.52	8.39	8.27	4.39
Public Gardens	**3.00**	**3.45**	**3.82**	**3.56**	**3.63**
Trade/ Commercial incl. Building trade	**5.93**	**6.24**	**6.47**	**6.21**	**6.15**
Hotels	1.33	1.29	1.30	1.27	1.10
Industrial	1.89	1.70	1.75	1.61	1.60
Agricultural	0.02	0.02	0.03	0.02	0.02
Others	2.00	2.00	2.00	2.00	2.00
Over all	**46.55**	**48.94**	**50.24**	**48.33**	**44.98**

Table shows the water supply by administrative sector. The main water consumption sector is the residential sector with approx. 50% of the overall urban consumption, as expected. But, in addition, the water used for irrigation of public gardens is on a very high level and ranges from 6.5% to 1997 to 7.6% in 1999 of the overall annual consumption in a region where water is a very scarce resource. The recently enacted new regulation[10] regarding the irrigation of public and private gardens will hopefully end up in a reducing water consumption for irrigation of gardens. The overall water demand in Tel Aviv - Jaffa is expected to increase over the next decades due to extreme population growth and an increasing living standard resulting in a strong need of demand management.

The general level of the total urban water consumption[11] is much higher compared with the consumption of other developed countries. The same picture can be drawn for residential water consumption only. But assessing the data one has to take into account the high amount of commuters and illegal workers, which redouble the number of urban consumers.

Table 4: Residential Water Consumption in Tel Aviv – Jaffa , 1997-2001

	1997	1998	1999	2000	2001
Population	348,600	348,117	350,753	354,428	354,400
Residential Water Consumption (mcm/ year)	25.88	26.72	26.48	25.4	26.08
Residential Water Consumption (Liter/ capita/ d)	203.40	210.29	206.83	196.34	201.61

3.5 The urban Sewage System and the Rainwater Drainage System

Originally based on individual septic tanks the sewage system of Tel Aviv – Jaffa is now centralized and services some 31.7 sqkm of the city area, approx. 70% of the total city area. It has a length of 650 km with various types of pipes. In the remaining area septic tanks are operated, but have been declared illegal if there is a possibility to use the central sewage system.

[10] Recently, additional regulations have been introduced under controversial discussions , that deal with the reduction in the use of water for watering gardens and public areas, as well as rules for cleaning tiled areas in public and industrial installations, and rules for washing vehicles in garages and services stations: Water Regulations (Use of Water in Rationing Areas, amendment No. 4), 2001, and Water Regulations (Rules for Washing Vehicles and Cleaning Tiled Areas with Water), 2001)

[11] The urban consumption is here defined as the total water consumption in the urban area (residential, industrial, agricultural, public, trade and commercial) for a specific year, divided by the number of residents in the city in that year.

The sewage system is organized and run by the Municipality of Tel Aviv – Jaffa. The urban sewage system itself is connected to the DAN Metropolitan Area Wastewater Reclamation Project (Shafdan) to purify the sewage. The plant has been operated since 1987 as a mechanical – biological plant. Effluents of the plant are recharged to a groundwater aquifer. After a detention time of approx. 400 days the water is pumped via a pipeline to deliver the high quality treated effluents or irrigation purposes to the southern and Negev region. A Master Plan for sewage deposal is no being prepared in order to change to present dissatisfying situation.[viii]

A rainwater drainage system covers approx. 60% of the city area. In present time it has a length of 155 km and accounts for 6,800 collection tanks. The main line were installed in the period of 1960-1985. As far as only a part of the urban area is covered with a rainwater drainage system problems come into view during the rainy winter month. While heavy rain events often several neighborhoods are completely flooded and where the rainwater drainage systems is connected to the sewers flooding creates massif technical and health risks due to overflow of the sewage system.

4 THE URBAN WATER POLICY OF TEL AVIV - JAFFA

The structure and system of a sustainable water management should be designed in such a way as to facilitate involvement by the responsible authorities at different levels. Participation by all stakeholders is essential for successful water management and usage. But in Israel responsibilities for water related services and resource management is highly centralized and the possibilities of the Water and Sewage Department of Tel Aviv – Jaffa to contribute to the decision making process are rarely.

Water in Israel is defined per law as a public property. So far every municipality in Israel gets as much water as the municipality asks for water from the governmental supply company MEKOROT [12]. Tel Aviv-Jaffa owns and operates wells but needs the permission of the Water Commission to do so. Sustainable management of water resources is not in their hands and, sometimes not always in the economic interest of the municipality of Tel Aviv-Jaffa.

The urban water policy strongly depends on the water policy of the state, which is actual supply oriented. Due to the critical supply orientated national water policy and the increasing urban demand large capital investments are required to enlarge the water resources and to adapt the urban supply system.

5 PRICING WATER IN URBAN ISRAEL – THE CASE OF TEL AVIV - JAFFA

Anything scarce and in demand commands a price: one of the basic principles of economics. Water in Israel is scarce regarding quantity as well as quality. Water pricing could be used as a policy instrument to balance the water demand and to reduce the pollution of water resources. Efficient and effective water pricing systems can provide incentives for efficient water use and for water quality protection.

The question how to price water has a long history of debate in Israel, although already in 1959 the Israeli Water Law laid down general rules for calculating the costs of water. Already in this early state of policy setting regarding prices the law asked to take into account ability to pay issues. The water sector in Israel has a long tradition of a low selling price of water for the agricultural sector in connection with an allotment policy of quotas resulting in harming the national economy and water resources. This had and still has a strong influence on the urban

[12] Water for agriculture and industry is served by means of quotas.

water pricing policy. First, the urban water prices are much higher than the prices for water charged in the agricultural sector subsidizing them. Second, any attempt to change the practice of water price setting one has to deal with the strong political power of the agricultural lobby and the difficult institutional decision making process.

5.1 The urban Water Tariff: Increasing Block Rates

All fresh water served in Israel (by MEKOROT) is paid by Increasing Block Rates charging Increasing Volumetric Rates for increasing consumption. Increasing Block Rates require metering. By law all water served in Israel is metered. Increasing Block Rates need to define consumption blocks over which rates increase. The rates usually are designed by customer classes (residential, agricultural, industrial). Theoretically, properly designed Increasing Block Rates recover class specific cost of service while sending a more conservation oriented price signal to the classes. Therefore Increasing Block Rates have been favored in relatively water scarce regions. But the price signal of Increasing Block Rates will only be sent, if the water price is calculated in economic terms, not by administrative policy decisions as it is still the situation in Israel

5.2 The Water Prices: Volume Rates per administrative Sectors for Tel Aviv-Jaffa

In Israel two water price types have to be distinguished: The water price the municipality has to pay to MEKOROT for getting water from the national water supplier and the water price consumers have to pay for their uses. Water Prices for urban water uses for the different administrative sectors are represented in Table 5.

If there is no residential consumption at all but a water meter is installed a very small Minimum Charge of NIS 16.20 per billing period is requested. Large families have a discount.

The difference between what the municipality of Tel Aviv – Jaffa has to pay to MEKOROT is supposed to be used for operating and maintenance expenses, taxes and capital related costs of the water system, but in reality most of the municipalities deserve a certain income used for general purposes of the municipality. So the additional income is used similar to a general tax income. In 2000 the additional income of the municipality of Tel Aviv - Jaffa amounted to NIS 1.924 Mio. Therefore in general every municipality has no economic interest that its customer saves water, but on the other hand the possibility to make some profit also engages the municipality to operate efficiently.

Table 5: Tel Aviv – Jaffa urban Water Prices, 1997-2002, in NIS[13]

MEKOROT Water price, which the municipality has to pay					
				2000	2002?
Residential				1.474	1.53
Industrial				1.436	1.492
Agricultural				0.89	0.857
	1997	1998	1999	2000	2002?
Residential, 2 month billing period[14]					
0-16 cm	2.32	2.35	2.54	2.69	2.69
16-30 cm	3.42	3.47	3.76	3.99	3.99
>30 cm	4.97	5.04	5.45	5.78	5.78

5.3 Water Rates based on Marginal Costs are under discussion

An important issue in estimating the marginal cost of water service is where the next increment of supply comes from and the cost of this supply increment. Rates based on marginal costs are forward looking and provide price signals that may promote efficient resource use and are appropriate for long term capacity planning, but the implementation also includes problems, e.g. marginal cost estimation or excess revenue stability.

Marginal cost pricing has been the subject of extensive discussion in water rate setting in Israel, which dramatically rose up again after the decision to build desalination plants with a large production capacity. The marginal cost price will then be determined by the cost of desalinated water of approx. NIS 2.50 per cm. Including additional costs for transporting the water from the desalination plant to the end user, the price will rise to approx. NIS 3.50 per cm, which at least the urban consumers would have to pay in the future. The new agricultural policy only predicts a water price of NIS 1.43 per cm for the year 2005, half of the estimated marginal cost price.[iv], [ix]

5.4 The Price of bottled Water and some notes about willingness to pay

During the last decade the consumption of bottled water has risen continuously. Due to the fact that there exists a lack of confidence in the quality of the water served by the public central supply system, people who can afford it, purchase bottled water. Bottled water is 500-1000 times more expensive than tap water. Besides this a large market has developed for household water purification systems despite the fact, that their utility is questionable. But Israeli citizens are hardly able to receive information about the quality of the tap water supplied, despite

[13] Due to the economic situation the Israeli currency varies strongly: Annual Exchange Rate for US$ 1: 1999: NIS 4.14; 2000: NIS 4.0773; 2001: NIS 4.2056; 2002: NIS 4.8867, Source: http://www.bankisrael.gov.il/deptdata/mth/average/averge.htm

[14] The water price for agriculture which farmers have to pay is different (2001): ordinary water (2nd degree effluent): NIS 0.52 per cm, Shafdan water: NIS 0.68 per cm; sweet water: for the first 50% of quota fixed in 1989: NIS 0.808, for the next 30% NIS 0.973 and NIS 1.305 for the remaining 20%. According to a proposed reform in agricultural policy (Government resolution No. 1741, April 28, 2002) the cheap water prices for agriculture will rise, resulting in 2005 in agricultural water prices as follows: sweet water: NIS 1.43; brackish basic water: 70% of the price of sweet water; Shafdan water: 75 %; ordinary water 50%. But the new policy still has to be brought into real life. Due to the low agricultural water price some settlements are asking for agricultural water quotas but because of a shift in their main business activity they do not use the water for agricultural purposes.

recently enacted regulations. Israel's water standards still lag behind European and WHO standards[15] [x]

This could be seen as a sign, that the public is willing to pay more for tap water in reliable quality if a reliable information system about water quality is installed, which has to be up-graded to the European and WHO standards.

5.5 Who pays the sewage?

Around 70% of the water consumed in urban areas in Israel returns in form of sewage, and of this, after treatment, 80-85% remain as effluents used e.g. for irrigation in agriculture. The municipality of Tel Aviv Jaffa imposed a sewage charge to finance its investments in sewage removal.

5.6 Use of Subsidies and Incentives

Every water supplier is asked to charge its customers to cover the Extraction Levy. The municipality of Tel Aviv – Jaffa on whom an Extraction Levy has been imposed is entitled to collect the same amount of money per water unit supplied from the water consumer, but in the same time the municipality is only allowed to charge prices posted by the government as shown in Table 5. It is questionable if the municipality charges their consumer cost recovery fees at least for the water produced from their own wells.

The water prices of MEKOROT, calculated on an average cost basis, are very low and don't reflect the scarcity of water at the present time. The first step was done with the recently introduced Extraction Levy. But, if the Extraction Levy is collected at all, the amount of money received is simply entering the general national budget and is not used for environmental purposes. Hopefully it will cover at least the 20% the state is paying to MEKOROT to fill up the public company's deficit. Today the public company only covers approx. 80-85% of its costs, the difference is covered by the state by general taxes.

In 1994 the Cost Plus method used by MEKOROT to calculate water costs was replaced by a more Supply Cost oriented method in which the fixed and variable costs were defined, and a 2.5% efficiency factor was imposed on the Company's performance. An increase in water prices coupled with improved performance (saving in energy costs and other variable and fixed costs) have resulted in a significant reduction in the Government's subsidy from 40% to 20% over the last years.

Under the current water price and tariff structure, water supplied to the most urban and industrial consumers incurs the Supply Cost, while water supplied to agriculture and urban customers in remote and hilly areas is partially subsidized.[xi]

Because of its geographical setting the price the municipality of Tel Aviv – Jaffa has to pay covers slightly more than the Supply Costs of the water from the National Water Carrier. Since the agricultural price is much lower the urban customers subsidize the water for agricultural purposes. The costs of water which is being supplied over long distances or to hilly customers are much higher than these municipalities have to pay for served water.

[15] In particular as regards nitrates and other inorganic minerals: The maximum concentration of nitrates that the WHO allows in drinking water is 45 mg per liter, while the Israeli standard was 90 mg, with 60 mg set as a target for 2006. The recommended concentration of chlorine is 250 mg per liter, while reports in Israel mention 600 mg of chlorine per liter as permissible in drinking water.

The intention to subsidize water for certain administrative sectors was and still is to serve national policy goals. Nearly self-sufficiency in food production is still an important national target although the number of imported products has been raising permanently over the last years. The foundation of new settlements far away from urban centers or in the dessert is still an important goal. Both examples require the transport of high values of water over long distances. But at present time the national agricultural policy goals are changing resulting in smaller water quotas for the agriculture sector and higher prices.

To reduce leakages every municipality will be punished with a fine if it has more than 12% water losses a year. A special water administration was set up to monitor and collect the contributions to the Water Networks Rehabilitation Fund, which is managed by the Municipal Waterworks Association. The money is used to assist municipalities in investments and renewals of their water networks.

SUMMARY

The state of the water sector for the last few decades may be defined as a state of imbalance between the supply of and demand for water, with the established system being unwilling to solve the problem by means of the price mechanism.

Instead of using price signals to reduce water demand, the water supply will be increased by installing several numbers of desalination plants with a planned production capacity of 400 mcm/year by 2005. Until now, the politicians refuse to install marginal cost pricing due to the fact, that this would reduce the level of irrigated farming. Furthermore, in 2002 after a long time of controversial negotiations the State of Israel and Turkey agreed that for the next 20 years Turkey would sell 50 mcm of water annually to Israel from the outflow of the Manavgat River into the Mediterranean Sea transported by water tankers to the port of Ashkelon. The price of the water will be about twice as expensive[16] as desalinated water.

The water price is equal for each consumer in the same administrative sector stretching the principle of equality all over the country. Thereby a sufficient supply of water in all tracts of Israel is realized.

Block Rates are installed to provide a basic service for every residential consumer and to encourage low-value uses. But complete recovery of Supply Costs by consumers, especially of the costs of MEKOROT is not ensured yet

The increasing recognition of water as finite resource has led to the implementation of a Extraction Levy recognizing the economic value of water to which a price had been attached. Different values are defined for different uses of water but the levels are questionable in all administrative sectors. To balance the increasing demand the right allocation of values to water uses will be necessary.

To reduce leakages every municipality will be punished with a fine if it has more than 12% water losses a year. The collected money goes to the Water Networks Rehabilitation Fund.

In the last decade a debate has started to develop an integrated water pricing policy identifying clearly institutional responsibilities nondependent on governmental decisions. It is necessary to

[16] Turkey asks for $0.19 per cm for water in the Turkish harbor and the total cost to Israel (including transportation) will be between $0.80 and $1.00 per cm. Both prices are not final and depend on the amount of water Israel will contract to purchase. The more Israel buys, the lower the price and transportation costs will be.

work towards providing a sound legal and policy water pricing framework. The role of different institutions involved in the providing services need to be revised.

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