The Parliamentary Committee of Inquiry on the Israeli Water Sector

Headed by MK David Magen

REPORT

Jerusalem, June 2002

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INTRODUCTION BY THE CHAIRMAN OF THE COMMITTEE

When the Knesset set up the Parliamentary Committee of Inquiry on the Israeli Water Sector on June 27, 2001, it assigned to it, in addition to its important tasks, two more matters:

1. To determine who is responsible for the crisis;
2. To recommend urgent steps and emergency measures (within the framework of an interim report).

On the first matter we establish clearly and firmly, who is responsible for the serious failures that were uncovered, but preferred not to mention names. All along the way, out of a sense of heavy responsibility, we concentrated on the effort to find practical solutions to the great distress. We did not seek "blood" - we sought water!

Soon after the first set of deliberations, we gave up the idea of publishing an interim report, due to a welcome problem: the activities of the Committee of Inquiry resulted, knowingly or unknowingly, in an acceleration of the Government's work concerning emergency measures to confront the crisis in the water sector. The strenuous activity of Minister for National Infrastructures Avigdor Lieberman, and of Prime Minister Ariel Sharon, as Chairman of the Ministerial Committee for Social and Economic Affairs, led to the establishment of an inter-ministerial emergency team, and to corresponding and parallel decisions to the emergency measures discussed in the deliberations of the Committee.

As aforesaid, this welcome activity led, several weeks ago, to a Government plan the main aspects of which are:

1. Government resolution No. 1682 (SE/32) of April 4, 2002, which speaks of:
   (a) Increasing the volume of desalination in Ashkelon to 100 million Cu.M per annum;
   (b) Terminating the procedures for selecting the desalination concessionaires for the small plants up to 65 million Cu.M per annum, so that production in them will begin by the end of 2004;

(c) Pushing forward the construction of desalination plants in the Hadera area with a capacity of 100 million Cu.M, so that they would also start producing by the end of 2004;

(d) Formulating a plan to produce an additional quantity of desalinated water, at a capacity of 90 million Cu.M by February 2005;

(e) Formulating, as soon as possible, an agreement to import from Turkey 50-100 million Cu.M of water per annum.

This resolution lays down that the total quantity of desalinated water will reach approximately 400 million Cu.M per annum.

2. Government resolution No. 1740/4 of April 28, 2002, that approves the reform in water prices for agriculture, which was formulated by the Ministry of Finance and the Ministry of Agriculture and Rural Development.

With a single sweep of a sickle, we sowed an additional crop: a master plan for the development of the water sector, until the year 2004, that was approved by the Minister for National Infrastructures on April 23, 2002. However, we were not satisfied with this, and demanded the formulation of a plan for the year 2040!

Not all the evidence that we heard, or studies and articles that we read, manifest themselves in the Report. For example, the forecasts of some of the best scientists in the spheres of the environment, climate, biology and ecology, who warn against the process of increasing desertification in the Mediterranean basin, and particularly rapidly in our region - remained in the background. We find both the mention and the harsh results important: the depletion of water sources and the growing consumption thereof. The need to stop, at some point, pumping water from the Sea of Galilee (which loses 267 million Cu.M of water every year just through evaporation!), and to plan its future rehabilitation (stopping completely the pumping of water for at least one year).

Matters concerning and connected with political considerations, are partially mentioned in the Report (importing water from Turkey, supplying water to Jordan, supplying water to the Palestinian Authority, cooperation with the Palestinian Authority for the preservation of the Mountain Aquifer, the use of desalinated seawater to increase regional cooperation) - the political issue is not within the frame of reference of the Committee.

The Committee of Inquiry was careful, in the course of formulating its summations, conclusions and recommendations (chapters 3 and 4 in the Report) to present only challenges

that may be realized. Regarding issues that raised disputes between the authorities, we took clear positions, as, for example:

The establishment of an independent, professional water authority;

1. Agriculture - we emphasize the importance of its existence as a national and strategic value;
2. "Mekorot" - we favor the company being strengthened, the removal of bureaucratic blockages, and exhausting its potential.

Our recommended that Emergency Regulation be issued in light of the emergency situation, was formulated following prolonged exertions. The crisis is so deep, and the shortage in the interim period will be so grave, that the ability "to maintain the provision and the vital services" (in the words of Basic Law: the Government, regarding Emergency Regulations) is placed in great doubt. The goal of the Regulations is to help the Government overcome the difficulties and the bureaucratic blockages.

We hope that all the responsible factors, will act together to implement the recommendations, and especially:

1. The establishment of an independent, professional water authority;
2. The necessary amendments in the legislation;
3. Cutting down the bureaucracy in the spheres of recycling and reclamation (enhancing the construction of sewage treatment plants, solutions to the problem of brine, and stopping the flow of effluents into the sea);
4. Improving measures to induce education, information and saving;
5. Encouraging the professions of water engineering, hydrology, water resource management etc., for the purpose of building a solid professional reserve, in order to broaden and deepen the spheres of research and development;
6. Returning the levels of the natural resources to above the hydraulic red lines by 2005, and after that - rehabilitating and strengthening the solidity of the natural water resources.

The Committee held 26 meetings (including two outdoor excursions). We invested more than 140 hours in further study, updating, deliberations and summing up.

I should like to thank the director of the Committee, Ms. Sigalit Edri, who coordinated with work of the Committee with skill and devotion.

The Knesset Research and Information Center, and especially Dr. Susan Hattis Rolef, who worked tirelessly to collect additional data and information, to examine it and guide the Committee by their light. In my eyes, her contribution has been immense!

I also wish to congratulate the Committee's legal advisor - the devoted attorney Sagit Afik.

The Committee also made use of professionals from outside the Knesset:

The economist, CPA Eyal Handler, who invested great efforts to make a special contribution to the Committee, and Dr. Aran Schluss, an expert in Administration, who contributed his experience and expertise, to organizing the work of the Committee. We thanks both.

Jerusalem
June 2, 2002

David Magen
Chairman of the Committee

2. The Establishment of the Parliamentary Committee of Inquiry on the Israeli Water Sector

2.1. The Background to the Establishment of the Committee

The background to the Knesset's decision to establish a parliamentary committee of inquiry on the subject of the water crisis in June 2001, was the sense of an ever-growing crisis, following three years of drought, and the fear that before the end of the Summer months, there might be a shortage of potable water.
There were several causes to the sense of crisis: reports on a fall to below the red lines in the three main water reservoirs of the country - the Sea of Galilee, the Mountain Aquifer, and the Coastal Aquifer; on a danger of contamination of the ground water; and the decision makers' delay in taking the necessary measures to deal effectively with the situation.

2.2. The Resolution Establishing the Committee

On May 23, 2001, Member of the Knesset David Magen raised the issue in the Knesset plenum, as a motion for the agenda, and requested that the Knesset debate the establishment of a parliamentary committee of inquiry "to investigate and find solutions to the crisis in the water sector".
On June 5, 2001, the plenum resolved to refer the subject to the House Committee, and after the House Committee held a deliberation on the subject, the Committee's Chairman, MK Yossi Katz, presented a proposal on its behalf, to appoint a parliamentary committee of inquiry on the Israeli water sector, in accordance with article 22 of Basic Law: the Knesset, and chapter 5 in the Knesset's Rules of Procedure.

2.3. The Committee's Terms of Reference

On June 27, 2001, the Knesset plenum approved the following draft resolution, brought by the House Committee to establish the Committee, and presented by the Chairman of the Committee MK Yossi Katz:

"In accordance with article 22 of Basic Law: the Knesset, the Knesset appoints a committee of inquiry on the issue of the water sector, with the following make-up:

1. David Magen - Chairman
2. Ofir Pines (Labor)
3. Avraham Hirschson (Likud)
4. Yair Peretz (Shas)
5. Avshalom Vilan (Meretz)
6. Zvulun Orlev (National Religious Party)
7. Eliezer Cohen (The National Union - Yisrael Beitenu)

"The powers and tasks of the Committee:

a. To investigate the reasons that had brought about the deep crisis in the water sector;
b. To determine what actions and malfunctions caused the crisis;
c. To determine what factors are responsible for the crisis;
d. To recommend urgent actions and emergency measures;
e. To examine proposals based on the construction of desalination plans, the reclamation of effluents for agriculture, the laying down of economic prices, including the determination of water prices for industry and education for the correct use of water;
f. To recommend long term solutions, including legislative amendments".

On July 19 2001, after the House Committee approved an increase in the number of members of parliamentary committees of inquiry to nine, two additional members were added to the Committee: Abd-Almalek Dahamshe (the United Arab List), and Eliezer Zandberg (Shinui).

2.4. The Committee's Work

Director of the Committee: Sigalit Edri; The Secretary of the Committee: Helen Elmaleh.

An advisory staff was appointed to the Committee, including the following members:

Advisors and researchers on behalf of the Knesset:

Dr. Susan Hattis Rolef - responsible for information and research for the Committee on behalf of the Knesset Research and Information Centre (RIC), and drafter of the Committee's Report; Attorney Sagit Afik - legal advisor to the Committee on behalf of the Legal Department of the Knesset, and drafter of the legal chapters of the Report; Ms. Tamar Marcus - an economist on behalf of the RIC, Mr. Shahar Goldman - legal expert on behalf of the RIC, Mr. El'ad van Gelder - research assistant on behalf of the RIC, Mr. Yaron Fishman - research assistant on behalf of the RIC.

External advisors:

Dr. Aran Schluss - advisor in public administration, and Deputy Dean of the School of Administration at the Interdisciplinary Center in Herzelia.

CPA Eyal Handler - Certified Public Accountant, economist and lawyer. Specialist in auditing, and tax consultant.

Until the end of January 2002 the Committee held 24 meetings, in the course of which over 130 witnesses appeared before it. The Committee went out on two excursions: one to the installations of the National Water Carrier run by "Mekorot" in the Sea of Galilee area, and the Eshkol site, and the second to the "Mekorot" desalination and sewage treatment installations in Eilat. In addition, the Committee received and sorted out a large quantity of written material supplied by the witnesses who appeared before it, and factors who did not appear before it, the advisory team held interviews with several persons, who did not manage to appear to the Committee plenum.

3. Summing Up and Conclusions

1. **On the basis of the entirety of the evidence heard by the Committee heard in the course of its meetings, and the written material presented to it, it states that for over 30 years the Israeli water sector has been in a deep and continuous crisis, that recently reached a critical point. The crisis has manifested itself in the depletion of the water resources, causing a cumulative deficit of around 2 billion Cu.M in the country's natural water reservoirs.**

2. **This sad and astonishing result is the sour fruit of a continuous failure by Israel's Governments, that ignored the writing that has been inscribed on the wall for many years.**
   The crisis was not brought about only by climatic changes, that caused a fall in the quantity of rain, nor even by the steep rise in the size of the population and its standards of living, in the last 50 years,. The astounding failure is primarily man-made!

3. **In light of the knowledge available to experts in Israel and abroad, an efficient and responsible management of the water sector could have prevented the crisis, by finding creative solutions to all the problems. The eyes of those responsible for the water sector in the various Governments, failed to take note of the dangers, and when they did see them - they failed to act.**

4. **The Committee has decided not to blame any particular person, at any particular point of time, for the failure. There were persons, bodies and Ministries, that at various times dealt with the issue of the water sector better than others.**
   The causes of the crisis stem from the following phenomena:

   (a) **The multitude of authorities dealing with the water issue, where there is no clear distribution of tasks and powers among them, and there are frequent fundamental differences of opinion regarding the desired policy, which lead to conflicts of interest; (See paragraphs 6.3.1. and 6.3.2.)**

(b) The collection of recommendations made by professional committees and parliamentary committees, as well as Government resolutions on the subject of water, is vast and rich, but most of them were ignored, and failed to be implemented; (See pragaraphs 6.3.4. and 6.3.5.)

(c) Despite the fact that since the 1980s several comprehensive and professional master plans for the development of the Israeli water sector were prepared, none of them was seriously discussed by the relevant Ministries, or the Government, nor approved. The Committee calls upon the Government to adopt and approve the new master plan published in April by the Water Commission; (See paragraph 6.3.5. and chapter 8)

(d) Despite the fact that since the 1960s, various reports by the State Comptroller have warned against failings and shortsightedness in the management of the water sector, the conclusions were not adopted and the lessons were not learnt. The 1990 Report of the State Comptroller on "The Management of the Water Sector in Israel", was especially serious. This Report warned against the liquidation of the water reserves of Israel, and agaisnt damage to their quality. (See paragraph 6.3.4.)

5. In the opinion of the Committee, the phenomena mentioned in article 4 above, are the result of the non-observance of a proper decision making process, based on checks and balances. (See paragraph 6.3.6.)

6. The Committee rejects the claim, as if "a spendthrift agriculture" is the cause of the crisis in the Israeli water sector, and that the crisis may be resolved by means of drastic cuts in agriculture, or its liquidation. In the eyes of the Committee agriculture has a Zionist-strategic-political value, which goes beyond its economic contribution. Nevertheless, there is no doubt that some of the captains of the agricultural sector, made errors and caused damage to both agriculture and the farmers, when for years they prevented a change in the system of water quotas, and the method of pricing water for agriculture, which would have limited the on-going crisis in the water sector. (See article 7.4.)

7. The Ministry of Finance, through its Budgets Department and Accountant General's Department, was, in fact, the factor guiding the water sector, and within this framework advanced it, and ensured that it would be run on the basis of economic criteria. However, its approach, which rejected flexibility and openness towards new ideas, resulted in a great delay in the plan to construct sufficient seawater desalination plants. The Ministry of Finance also erred when it froze initiatives by "Mekorot", and prevented it from making its professional contribution to limit the crisis.

8. The Committee takes note of the positive turn, which occurred during the term of the 28th Government[1], which "grabbed the bull by its horns" in an effort to contend with the crisis in the water sector. Within its framework Minister of Agriculture Haim Oron, and Minister of Finance Avraham Beiga Shohat, who also served for a certain period as Minister for National Infrastructures, brought about a conceptual change regarding the nature of agriculture in Israel, and the need to start desalinating seawater.

9. The Committee wishes to point out, that during term of the 29th Government (the current one), vigorous measures were taken to deal with the crisis in the Israeli water sector. Before resigning, Minister for National Infrastructures, Avigdor Lieberman, started taking impressive emergency measures, and together with Prime Minister Ariel Sharon, who also serves as Chairman of the Ministerial Committee for Social and Economic Affairs, brought about a radical change that will lead - so the Committee believes and hopes - to a recovery of the water sector.

[1] The 28th Government was that headed by Ehud Barak (1999-2001)

10. The initiative of the Minister of Agriculture and Rural Development, Shalom Simhon, and Minister of Finance Silvan Shalom, to formulate a reform in water prices for agriculture, on the basis of which these prices and the (water) production levies will be gradually raised, which was approved by the Government on April 28, 2002, in resolution No. 1740, is worthy of special note as a significant breakthrough. The Committee is of the opinion that the compensation to the farmers for working the land, within the framework of this reform, should be realistic, updated, and entrenched in primary legislation. (See article 7.4. and 9.5.)

11. The Committee considers the method of pricing water for the urban consumer objectionable. The difference between the cost of the water to the local authority, and the price that it charges the consumer, is unreasonable. It is the Committee's hope that the gradual application in all the local authorities of the Law for Water and Sewage Associations of 2001, will lead to a real change in this situation, which may be defined as extortion. (See article 9.5.)

12. The development of sewage treatment plants, and the conveyance of effluents to agricultural areas, where they may be used, is much behind schedule. Even though the Ministry of Finance appears to be willing to provide those prepared to develop sewage treatment plants with generous grants from the "balancing fund"[2], whose activity was terminated three years ago, bureaucratic blockages and a lack of response from the side of authorities and entrepreneurs, have resulted in a disappointing level of activity. One of the results is that vast quantities of raw sewage and effluents are still running in several places in the country into the sea. (See paragraph 9.6.3.)

[2] The Balancing Fund for water payments was set up in April 1962, on the basis of the Water Law. Its goal was to reduce the differences between the cost of water in various parts of the country. This goal was attained by means of levies on the producers and suppliers of water, whose expenses are lower than those laid down in the regulations, and the provision of grants to producers and suppliers, whose expenses are higher than those laid down in the regulations. The income of the Fund came from the balancing levies, the State budget, from interest on deposits and a special charge. Up to 1995 the Fund was dealt with by the Ministry of Agriculture. In that year the Fund was handed over to the Ministry of Finance. Until it was cancelled in 1999, NIS 800 million accumulated in the Fund.

13. **In the opinion of the Committee, bringing private factors into the water sector is a positive development, but it would like to warn, that there are certain spheres of activity which ought to remain in the hands of the public sector, such as planning on the national and regional levels, general responsibility for the construction of national systems such as pipelines, artificial recharge systems, and the direction and encouragement of research. On the other hand, it is desirable that spheres in which competition could help the water sector, and reduce the financial burden from the shoulders of the public sector, should be opened to competition. *Inter alia*, these include, desalination and sewage treatment. The decision makers must learn from the experience of other countries which have gained experience in transferring parts of the water sector into private hands. (See paragraph 9.6.2.)**

14. **In view of the fact that the Government resolution of April 4, 2002, dealing with the importation of 50-100 million Cu.M of water from Turkey, did not result exclusively from considerations associated with the water sector, the Committee has avoided a conclusive deliberation of this issue. (See paragraph 9.6.4.)**

15. **The Committee avoided dealing with the agreements for the supply of water and the diversion of desalinated seawater to Jordan and the Palestinian Authority. These issues are in the hands of the appropriate political forums. At the same time, the Committee is aware of the fact that the inhabitants of the Palestinian Authority, as well as the inhabitants of Jordan, are suffering from a shortage in water resources, and therefore it calls upon the political echelons to find the golden path to fulfill the requirements of all the above mentioned inhabitants, on an equal and just basis.**

16. **The agreements for the supply of water to Jordan and the Palestinian Authority are connected and are in the hands of the political forums. However, the joint utilization of the (North-Eastern) Mountain Aquifer, and preventing its contamination, belongs to the professional sphere, and the main responsibility in this sphere should be in the hands of the Water Commission. (See paragraph 9.7.1.)**

4. The Committee's Recommendations

1. Emergency Regulation

(a) **On Friday, July 11, 2001, two weeks after the establishment of the Committee of Inquiry, the Knesset announced (on the basis of a Government initiative, as occurs every year) a state of emergency.**

Around the same time, and in view of the depth of the crisis in the water sector, the Committee considered publishing an interim report, which would include a recommendation to introduce emergency regulations, to deal with the water sector. In light of the opinion of the Committee's legal advisor, of September 16, 2001, the Committee decided not to recommend the introduction of emergency regulations in its interim report - a report, which was finally not published.

b) **After hearing all the evidence, and in view of the worsening in the crisis in the water sector, to the point that there was a danger to the regular supply of water, the Committee believes that in the current circumstances, the condition of "maintaining the supply and vital services" (in the words of Basic Law: the Government) exists, in the fullest sense,.**

(c) **On May 2, 2002, the Government decided, in resolution No. 1769, to propose to the Knesset once again to declare a state of emergency, in continuation to the declaration of July 2001.**

(d) **In view of the declaration of a state of emergency, and in order to ensure the regular supply of potable water to the population, as well as water for other uses, until the seawater desalination plants will start operating, and the supply of water will increase by other means, the Committee recommends that emergency regulations be introduced, at the center of which will be:**

(1) **Authorizing the Water Commissioner to reduce production, supply or consumption of water from various sources, or from a specific defined source, should the hydrological or climatic conditions make this necessary;**

(2) **Authorizing the Water Commissioner to issue new production licenses, adapted to the emergency, that will enable him to implement changes in the production licenses, by means of quick procedures, on the basis of his professional consideration;**

(3) **Authorizing the Water Commissioner to initiate and publish tenders for the construction of enterprises for the development of new water sources, and to advance projects in the water sector, by means of quick procedures, within an approved budget framework, while preserving the professional and administrative authority in his own hands;**

(4) **Establishing special planning committees to approve enterprises and projects in the water sector by means of a short and quick procedure, as long as the regulations are in force;**

(5) **Authorizing the Water Commissioner to connect private wells to the national water system, and to activate wells that went out of use in the past, with the goal of supplying potable water, and water for home consumption;**

(6) **Authorizing the Water Commissioner to instruct the local authorities and the water associations to manage the water systems efficiently and frugally, including the installation or replacement of accessories or installations to ensure the efficient use of water;**

(7) **Authorizing the Water Commission to stop production, supply or consumption of water immediately, in any case of a danger of contamination;**

(8) **Authorizing the Water Commissioner to apply comprehensive inspection, enter any location and perform any act necessary to protect a source of water, in order to preserve it and ensure compliance with the conditions in the license. The Commissioner will be authorized to impose financial sanctions, to open criminal proceedings, to close a water source and to suspend a production license, to the extent required under the circumstances;**

(9) **Concentrating the legislative powers on water matters, in the hands of the Prime Minister;**

(10) **Authorizing the Prime Minister, in consultation with the Minister of Finance, the Minister for National Infrastructures, and the Minister of Agriculture and Rural Development, to fix the various water prices and production levies during the emergency period, according to the needs.**

2. The Interim Period

(a) **Government resolution No. 1682 (SE/32) of April 4, 2002, defines an interim period that is supposed to end in February 2005. By this time the Government assumes that the State will have reached a desalination capacity of 400 million Cu.M per annum, with the possibility of importing a quantity of 50-100 million Cu.M of water per annum. (See paragraph 9.6.1.)**

(b) **The Committee believes, that the Government has set for itself a lofty challenge, and there is doubt whether it will be able to fulfill it in the defined period.**

(c) **The Committee believes that the period required to achieve the above organization, will continue until January 2006, at the earliest. In this interim period it is advisable that:**

(1) **Immediate measures be taken to strengthen all the divisions in the Water Commission, in terms of resources and manpower;**

(2) **The independence of the Water Commissioner, who will be subject to the supervision of the Government, through the Prime Minister only, be defined;**

(3) **A ministerial committee for natural resources, agriculture and the environment be set up and put into operation, and it will examine the Master Plan for the development of the water sector until 2010, that was presented by the Water Commission in April 2002; (See chapter 8)**

(4) **The Ministerial Committee shall act in cooperation with the Water Commission to formulate a long term master plan, until 2040;**

(5) **The Ministerial Committee shall initiate and prepare a new water law; (See chapter 6 in the recommendations)**

(6) **The Ministerial Committee shall follow up the implementation of the reform regarding the water prices for agriculture, and the support for the preservation of agricultural areas, that was approved in article 4 of Government resolution No. 1740 of April 28, 2002. The rate of the compensation fixed for farmers within the framework of the reform, will be enforced through legislation; (See article 7.4.)**

(7) **The Ministerial Committee shall set up a professional committee for the pricing of water, and for fixing the production levies; (See article 9.5.)**

(8) **The Ministerial Committee shall receive current reports regarding the pumping of water from the various reservoirs throughout the interim period; (See article 9.7.)**

(9) The Ministerial Committee shall receive reports regarding the allocation of water to the various sectors. (See paragraph 9.4.1.)

3. Organizational Reform in the Israeli Water Sector

(a) The multiplicity of bodies dealing with the water sector, and the faulty decision making process resulting from this reality, is one of the main factors that led to the deep crisis. The relation between the size of the responsibility and the number of authorities responsible, is inverse. The Committee learned, that as the number of authorities and bodies, that are responsible or connected to the responsibility for the water sector grew, so the responsibility of each one of them diminished. (See article 7.3.)

(b) The leading principle in the reform being proposed by the Committee, is the reduction, to the point of abolition, of the administrative involvement of the Government in the allocation of water and its uses. The link to the Government shall be by means of the Minister for National Infrastructures, and in times of emergency, by means of the Prime Minister.

(c) The role and authority of every Ministry connected to the water sector, shall be defined by law.

(d) The Water Commission shall turn into an independent and professional authority, which will not be within the framework of any Ministry. Despite this change, the ministerial responsibility regarding the water sector shall remain in the hands of the Minister for National Infrastructures. The role of the Authority shall be to manage, settle and direct the water sector on the national and regional level, in accordance with up-to-date instructions in the Water Authority Law, the Government's policy, and the recommendations of the Water Council.

(e) The Water Commissioner shall be selected by the Government, on the basis of the recommendation of the Minister for National Infrastructures, for a term of seven years. In special circumstances the Government will be able to prolong this period. The Commissioner shall be a professional in the sphere of water. He shall work in coordination with the Water Council.

(f) The powers of the Water Commissioner, and the body which he heads, shall be:

(1) Overall responsibility for the availability of water for the whole population;

(2) The preservation of natural water resources;

(3) The planning and development of water resources;

(4) Fixing the annual production quotas for all the natural water resources, and each source separately;

(5) Settling the issue of supply by means of licensing, concessions and supervision over the suppliers;

(6) Intervention in the supply arrangements under conditions of shortage, while giving priority to the supply of potable water;

(7) Determining supply areas throughout the country, and water suppliers in every region.

(g) Within the framework of the Water Commission or the Water Authority, a body shall be set up that will be responsible for the publication of, as far as possible, full, agreed and updated data, in all spheres of the water sector. (See article 9.10.)

(h) The Committee recommends that the structure of the Water Council, as an advisory body to the Water Commission, and later on the Water Authority, shall be changed. The number of members in the Council shall be reduced significantly, and its make-up shall be changed, so that the Council will include experts and professionals side by side with representatives of the Government and representatives of the consumers and producers. The representatives of the consumers will include the representatives of the farmers, the representatives of the urban consumers, and the representatives of the bodies responsible for protecting the environment. In order to secure for the Council a constructive role in the formulation of policy, no particular interest group should have decisive influence over the Council's recommendations or decisions. (See paragraph 9.2.4.)

(i) A statutory professional committee for the pricing of water, shall be set up. The Committee shall hold extensive discussions on the principles for fixing the prices for the various types and qualities of water, whether produced by "Mekorot" or by private factors, and on the criteria for determining the production levy. After the principles for the pricing of water are decided, the Committee shall turn into a body, that from time to time takes decisions regarding changes in water prices. The decisions of the committee on this issue shall be final, and shall not be subject to appeal. (See article 9.5.)

(j) Supply areas shall be determined. In every area one of several licensees, or concession holders shall be selected to be the regional water suppliers. The local authorities and water and sewage associations shall be the regional water suppliers within clearly defined municipal areas. The water suppliers shall be responsible for the supply of water, to every consumer in the area under their responsibility. The supplier shall be obliged:

(1) **To purchase a sufficient quantity of water to fulfill all the requirements of the consumers in the supply area;**

(2) **To supply every quantity of water and every quality of water to every consumer in the area;**

(3) **To construct an adequate infrastructure for the fulfillment of these duties;**

(4) **To supply conveyance services for water producers and other suppliers outside the area.**

4. Legislation Amendments

(a) The Committee recommends a fudnamental change in the existing legislation on the water issue.

(b) The various water laws shall be gathered into a single framework - the new Water Law - that shall reflect a clear and logical policy regarding the water sector.

(c) The issues scattered today in regulations and secondary legislation, shall be moved into the framework of the primary legislation, with the goal of increasing public awareness to them, and improving the ways of enforcing them. (See paragraph 9.3.1.)

(d) All the organizational changes proposed in chapter 3 of the recommendations shall be enacted, including:

(1) **The strengthening of the Water Commission and turning it into an independent authority;**

(2) **The strengthening of the Water Commissioner's status;**

(3) **A structural change in the Water Council;**

(4) **The establishment of a professional committee for the pricing of water;**

(5) **The division of the country into supply areas, in each of which there shall be one or more authorized water suppliers.**

(e) The conditions for preserving the quality of water shall be laid down in legislation, and resources and means shall be allocated to enforce the laws in this sphere. (See article 9.8.)

(f) The water requirements of nature shall be recognized in the legislation. (See article 9.9.)

5. "Mekorot"[3]

(a) **The Committee was impressed by the concrete activities of "Mekorot", and by the fact that the company has prepared itself in practical terms to play a central role in the development of the water sector, in coordination with the Water Commission.**

(b) **The delay in the plans for desalination, the decision to encourage competition in the water sector and the continued lack of clarity regarding Mekorot's future, were damaging to the company, and its ability to integrate effectively in the rapid development now required in the water sector.**

(c) **The Committee welcomes the understandings recently reached between the Ministry of Finance "Mekorot", and calls upon the Government to sign, as soon as possible, the new economic agreement, that was formulated, in order to enable the company to become more efficient, and to integrate into the urgent activity for developing the water sector.**

The new structure of "Mekorot" shall enable it to be involved in entrepreneurship, and in the construction of water enterprises of all sorts, in addition to operating existing installations and plants. The Ministry of Finance must lift the remaining administrative constraints, that limit the company's activities.

(d) **In view of the urgency, and in light of the vast scope of the activities required in the coming years, it is important that the professional capacity of "Mekorot"be taken advantage of, to advance the construction of various types of desalination plants, and their integration into the national conveyance system, and to develop sewage treatment plants, the conveyance of effluents and the creation of storage capacity for water.**

(e) **According to data received by the Committee from "Mekorot", should the company be given the necessary permits, it will be able to increase the quantity of water available to the economy by approximately 350 million Cu.M per annum, beyond the plans already approved by the Government, through the desalination of another 150 million Cu.M of brackish water, and an addition of around 200 million Cu.M of effluents for irrigation.**

(f) **The Committee recommends that the construction of the Eastern Conduit, for the conveyance of effluents from the Center of the country to its South, as planned by "Mekorot", shall be reconsidered.**

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[3] About "Mekorot" see paragraphs 6.3.2. and 9.2.5.

6. Saving Water[4]

(a) **The Committee calls for a reduction in the consumption of water by the following means:**

(1) **Education and the inculcation of the value of not wasting water, by means of all levels of the education system;**

(2) **Applying harsh sanctions on those who waste water.;**

(3) **Incentives to those who save water;**

(4) **Information activities by means of the written and electronic media, and other means of publication.**

(b) **The Water Commission shall encourage the introduction of water saving devices such as new two-quantity (6/3 liter) toilet flush tanks, saving devices for faucets and showers in apartments, offices and public installations.**

(c) **The Water Commission shall encourage the development and dissemination of technologies for the economical use of water, and for water conserving construction (the gathering of run-off water).**

(d) **The Water Commission and the local authorities shall encourage a change over from "water guzzling": gardening to gardening suited to the conditions in the country.**

(e) **One should learn from the experience of countries, that have succeeded in reaching impressive achievements in the saving of water, against the background of shortages.** **(See paragraph 9.4.2.)**

7. A Master Plan and Planning

(a) **Following the formulation of a master plan for the development of the water sector until the year 2010, as prepared by the Water Commission, the Committee recommends the completion, as soon as possible, of the process of formulating and approving a master plan for the long run, up to the year 2040.**

[4] See article 9.4.

(b) The Committee has been impressed by the fact that there is no systematic policy regarding the storage of water from new sources, and its dilution with other water. The Committee recommends that the issue be treated rapidly, within the framework of the implementation of the Master Plan for the Development of the Water Sector, involving maximal cooperation with "Mekorot" and the Jewish National Fund. (See paragraph 9.7.2.)

(c) The Committee supports the gradual cancellation of the system of water allocations, but recommends that as long as the system of allocating water for agriculture continues, it shall be done in a manner that will enable the farmers to plan the year according to the agricultural calendar and not the financial calendar. (See paragraph 9.4.1.)

(d) The Committee supports the position of the Water Commissioner, that one should not continue the over-pumping from the Coastal Aquifer. The Committee recommends that the over-pumping from this aquifer, as from the other natural reservoirs, should be inspected closely. Regarding the Mountain Aquifer, the Committee welcomes the fact that resources have recently been allocated for monitoring drillings in it.

(e) The Committee recommends that when the desalinated seawater enters the system, a new policy shall be laid down regarding the management of the natural reservoirs in general, and the pumping from the Sea of Galilee for the National Carrier, in particular. (See paragraph 9.7.1.)

8. Increasing the Water Potential

(a) The Committee gives its blessing to the plan, prepared by the Planning Division of the Water Commission, that calls for a desalination capacity of close to 500 million Cu.M by the year 2010, and congratulates the Government upon its resolution of April 4, 2002, that approves desalination projects with a capacity of 400 million

Cu.M by the beginning of 2005.

The Committee express its concern regarding the possibility, that once the Master Plan is approved, it might become apparent, that there is insufficient execution capacity, to keep up with the timetable laid down. Therefore, a special effort must be made to increase the execution capacity of the public and private bodies operating in the water sector.

The Committee also views as highly important, rapid activities, that will ensure that the pipeline infrastructures and the infrastructures for artificial recharging of aquifers, that must accompany the construction of the desalination plants, shall be planned and laid down on time.

This activity must be implemented primarily by "Mekorot". (See paragraph 9.6.1.)

(b) The Committee supports all the plans for the desalination of brackish water, in all those areas where this is economical - in other words, where the cost of drilling the water and their desalination is worthwhile, and there is local demand for this water, or it is possible to convey it easily to the national or local pipeline networks. (See paragraph 9.6.2.)

(c) The Committee considers the comprehensive treatment of the issue of sewage purification, and the establishment and operation of a system that will convey the effluents to the areas where they can be used, or stored, and to bring about the introduction of regulations regarding their quality, as extremely urgent.

It is important that there should be one central body that takes the necessary decisions, and applies them rapidly and efficiently. It is necessary that a clear decision be taken regarding the distribution of the execution between "Mekorot" and the private sector. (See paragraph 9.6.3.)

9. A Professional Reserve and Research

(a) The professional manpower in Israel in the sphere of water, and especially its hydrologists and water engineers, have been, since the establishment of the State, world leaders in terms of their know-how and imagination. However, over the years, their numbers have dwindled, and even though the high professional standards have been upheld, there is concern in face of the limited number of youngsters that choose to enter this area.

Government initiatives are required to offer incentives to students to chose the subject of water, in order to secure a human and professional infrastructure of

the highest level in future as well, which will be large enough to comply with the new challenges.

(b) Increasing the academic staff in the sphere of water, will also enable the expansion of research on subjects in which the existing know-how is insufficient, such as reducing the price of existing technologies for seawater desalination, and the development of new desalination technologies; the hydrology of natural resources, and their management; sewage treatment and its reclamation; and the viability of utilizing the fossil water, which is to be found in the Negev in unlimited quantities.

(c) A department for the management and coordination of research in the sphere of water, shall be set up within the framework of the Water Commission or Water Authority. The Government shall provide the department with a apapropriate and worthy budget for the purpose of research in the sphere of water, that will be devoted to both empirical and applied studies in the various universities, research institutes and in industry, on subjects important to the Israeli and regional water sectors. The department shall operate in full cooperation with the Ministry of Science, Culture and Sports. (See article 9.11)

5. The State of the Israeli Water Sector

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 on the one hand, or to act with sufficient decisiveness to do so by increasing the supply of water, on the other hand.

5.1. The Supply of Water

On the supply side the experts speak of the "average water potential", which is "that quantity (of water) that may be produced, on a multi-annual average, without damaging the sources of water".[5]

As to accurate data regarding this potential, for the last 60 years there have been differences of opinion on this issue, though it is clear that the potential is supposed to decrease when the quantity of rainfall decreases, and the potential is supposed to increase when there is an addition of "new" water from new sources such as water desalination, reclaimed water, floodwater and imported water.

> "In the 1940s there was a dispute between the Zionist water experts who estimated the potential at 3,000 million Cu.M per annum... and the experts of the Mandatory Government hydrological experts, who estimated it in the region of 1,500-2,000 million Cu.M per annum... The echoes of this argument continued into the 1950s in the deliberations of the Committee for the Planning of the National Water Project... With hindsight, it appears that it was the conservative hydrologists of the 'foreign rule' who were right in the argument on the volume of the water potential. In the first decade of the State's existence, there was a clear trend of 'lowering the level of the Zionist vision' (irrigating 8 million dunams with 4,000 million Cu.M per annum). As more accurate data were gathered, so the annual potential approached the estimates of the Mandatory experts..." [6]

However, until the experts reached realistic figures, all sorts of strange data, that influenced the decision makers, were spread around. So, for example, the State Comptroller's report for 1966 stated that the annual average water potential is around 1.5 billion Cu.M. It should be remembered that this was one year before the Six Day War, and one was talking of natural water only.[7] A decade later the State Comptroller's report stated that the average potential is

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[5] The State Comptroller, *Annual Report No. 37*, Jerusalem, 1987, p. 543 (Hebrew)

[6] Avishai Ben-Porath, "The National Water Enterprise - 100 Years of Vision and 37 years of Experience",*Mayim Vehashkaya*, January 2002, No. 423, p. 25 (Hebrew)

[7] The State Comptroller, *Annual Report No. 16*, Jerusalem, 1966, p. 283 (Hebrew)

around 1.4 billion Cu.M, in a situation where one was still talking almost exclusively about natural water.[8]

In their book *Water in Israel 1962-1989*, Zvi Grunwald and Michael Bibbas gave the figure for the potential of natural water (sweet and brackish) in Israel (including the territories) as 2.323 million Cu.M per annum, pointing out that around 120 of these were not exploitable due to their high price. Together with reclaimed water they stated that the potential is 2,610 million Cu.M.[9]

The entry "Hydrology" in the 1993 edition of the *Hebrew Encyclopaedia*, states that the water potential of Israel, including reclaimed water, is 2,229 million Cu.M, divided as follows: 570 million Cu.M in the Sea of Galilee, 1,199 million Cu.M sweet and brackish ground water, 135 million Cu.M caught floodwaters, 325 million Cu.M reclaimed water.[10]

The report prepared by a committee headed by Prof. Avishai Braverman for the World Bank in 1994, claims that Israel's potential of natural water is around 1.6 billion Cu.M, of which around 60% comes from the Yarkon-Taninim Aquifer (part of the Mountain Aquifer) and the Coastal Aquifer, around 35% from the Jordan River basin and 5% from floodwaters.[11]

In the Arlozoroff Report the figure of 1.6-1.8 billion Cu.M appears. The Report explains that the inability to give an accurate figure results, *inter alia*, from decisions regarding the permitted water levels in the various reservoirs, assumptions regarding the salination of the sources, resulting from changes in the levels of the water table, and the economic viability of developing marginal water sources.[12]

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[8] The State Comptroller, *Annual Report No. 26*, Jerusalem, 1976, p. 483 (Hebrew)

[9] Zvi Grunwald and Michael Bibbas, *Water in Israel*, Tel-Aviv, the Ministry of Agriculture, the Water Commission, Allocation and Licensing Division, 1989, p. 35

[10] *The Hebrew Encyclopaedia*, Sixth Volume (1) Eretz Yisrael, Jerusalem and Tel-Aviv, Hevra Lehotza'at Encyclopaediot Ltd., and Sifriyat Po'alim, 1993, p. 187 (Hebrew). The entry was written by Prof. Eliyahu Rosenthal (from the Hebrew University)

[11] Ben-Gurion University of the Negev in Cooperation with "Tahal" Consulting Engineers Ltd. Israel, *Water Study for the World Bank*, August 1994, pp. 2-4

[12] Annex B in Shaul Arlozoroff chairman, *Report of the Committee for examining the Administration of the Supply of Water in Israel*, Tel-Aviv, April 1997 (Hebrew)

Appearing before the Knesset State Control Committee in the beginning of 2000, the then Water Commissioner, Meir Ben-Meir, argued that the water potential of Israel is 1,820 million Cu.M and another 100 million Cu.M of desalinated brackish water - in other words, 1,920 million Cu.M.[13] Ben-Meir repeated this figure when he appeared before the Parliamentary Committee of Inquiry,[14] which led to an angry reaction by the current Water Commissioner, Shimon Tal, who wrote that the figure of the Water Commission is 1,555 million Cu.M and "Perhaps (Ben-Meir's) reliance on these figures is what led us to so deep a crisis".[15]

In the Master Plan (transition) presented by the Water Commission in April 2002, the following scenario for the water potential of Israel in the coming decade is offered, on the basis of the figures of the last decade (an annual average of 1,532 million Cu.M):

Table No. 1: A basic scenario of sweet water balances in the national system for the coming decade, based on the data of the last decade (millions of Cu.M

Year/source	2002	2003	2004	2005	2006	2007	2008	2009	2010
Natural enrichment*	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**	**1,531**

Source: table No. 12, the Ministry for National Infrastructures and the Planning Division in the Water Commission, *Master plan (transition) for the Development of the Water Sector in the Years 2002-2010,* Final Report, April 2002, p. 49 (Hebrew). Other more and less optimistic scenarios were also brought.

* Less overflows and flowing into the sea

5.2. The Demand for Water

While the supply of natural water does not increase, and possibly even decreases, and in order to increase the supply it is necessary to catch, produce or import additional water, the demand for water keeps growing all the time, both because of the continuous growth in the

[13] Lecture by Meir Ben-Meir before the Knesset State Control Committee on January 3, 2000

[14] Evidence given to the Committee by Meir Ben-Meir, on August 13, 2001

[15] Letter by Shimon Tal, read to the Committee on August 16, 2001

population[16] and because of the constant rise in the standards of living of all parts of the population.

The State Comptroller's report for 1966 reported, that the exploitation of water sources reaches "more than 80% of the potential quantities of natural water in Israel", and in 1964/65 reached "1.23 billion Cu.M".[17] According to the State Comptroller's report for 1976, the consumption of water in Israel reached 1.6 billion Cu.M.[18]

The development in the consumption of water since 1986, by destination, may be seen in table No.2, and the consumption of water by type of water since 1993, may be seen in table No. 3.

Table No. 2: The distribution of the total consumption of water (sweet, brackish and effluents from the Shafdan[19]) by destination, in million Cu.M

Year/sector	Agriculture	Domestic	Industry	Total
1986	1,125	423	104	1,652
1987	1,188	445	109	1,742
1988	1,250	500	109	1,860
1989	1,236	501	114	1,851
1990	1,162	481	106	1,749
1991	875	445	100	1,420
1992	955	490	106	1,551
1993	1,125	527	110	1,762
1994	1,144	556	114	1,813
1995	1,274	588	119	1,981
1996	1,284	662	124	2,071
1997	1,264	705	123	2,092
1998	1,365	768	129	2,262
1999	1,265	765	127	2,157
2000	1,113	794	125	2,032

Until 1992 the source of the figures is the Ministry for National Infrastructures - the Water Commission, the Hydrological Service, U*ntil the Autumn of 2000*, Jerusalem, May 2001, p. IV
From 1993 the source of the figures is the Water Commission, as presented to the Committee by "Mekorot", and they include floodwater. The figures for 2000 are preliminary figures only

[16] In Western Eretz Yisrael there are today close to 10 million inhabitants compared to 2 million in 1948, and in the State of Israel today there are slight more than 6.5 million inhabitants compared to around 800,000 at the time that the State was founded

[17] The State Comptroller, *Annual Report No. 16*, Jerusalem, 1966, p. 284 (Hebrew)

[18] The State Comptroller, *Annual Report No. 26*, Jerusalem, 1976, p. 483 (Hebrew)

[19] The Shafdan is the sewage treatment system for Tel-Aviv and its environs. It is the largest and most sophisticated system of its kind in Israel, and started to operate in the mid 1980s. The system produces over 120 million Cu.M of effluents of the highest quality, that are used to irrigate agricultural lands, especially in the Western Negev

Table No. 3: The distribution of the demand for water according to types of water

Type of water/year	Sweet water	Effluents	Brackish water	Floodwater	Total
1993	1,463	200	78	21	1,762
1994	1,491	219	84	19	1,813
1995	1,584	250	77	70	1,981
1996	1,659	270	110	32	2,071
1997	1,662	255	122	52	2,092
1998	1,796	271	135	61	2,262
1999	1,694	269	138	56	2,157
2000	1,586	262	134	50	2,032

The figures are those of the Water Commission as presented to the Committee by "Mekorot". The figures for 2000 are preliminary figures only.

It should be noted that the professionals regard the demand for water for domestic uses and industry as inflexible, and the demand for water for agriculture and gardening as flexible. In the short run it is possible that one might slightly reduce the demand for water, but in the long run the demand for water will only rise (See articles 7.4. and 9.4.)

The Water Commission presented the following scenario for the demand for water in the coming decade. In the scenarios for sources it wishes to reach a state of balance by the year 2010:

Table No. 4: The demand for sweet water in the coming decade in millions of Cu.M

Year/ sector	Agriculture	Urban	Industry	Nature and landscape	Total Israel (natural sweet and desalinated)	Total Israel (sweet. brackish and effluents)	Total sweet water Israel, Jordanians and Palestinians*
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

Based on figures appearing in table Nos 5 and 6 in the Ministry for National Infrastructures and the Planning Division in the Water Commission, *Master plan (transition) for the Development of the Water Sector in the Years 2002-2010,* Final Report, April 2002, p. 17 (Hebrew).

* Regarding the Jordanians and Palestinians, we are speaking only of sweet water supplied by Israel to them, and water which the Palestinians pump from the Yarkon-Taninim Aquifer

These figures do not include water that should be infused into the natural reservoirs, in order to rehabilitate them.

5.3. Over-pumping

Despite the arguments amongst the professionals regarding the "red lines" in the various aquifers and the Sea of Galilee (See paragraph 9.7.1.), there is no doubt that due to the continuous gap between the water potential and the exploitation, over-pumping, that has placed the system into a state of deficit, has taken place. The argument among the professionals is especially on the question whether irreversible damage has already been caused, or whether it is still possible to rehabilitate the various reservoirs.
In her special report on the management of the water sector of 1990, the State Comptroller, Miriam Ben-Porath, argued that the cumulative deficit in the three main reservoirs had reached around 1.6 billion Cu.M at the end of 1990.[20] The heavy rains of the winter of 1991/92 temporarily did away with the deficit, but after several years it started to return.
In the course of the Committee's meetings the figure 2 billion Cu.M came up several times, as the cumulative deficit today. The Water Commissioner said, that in the year 2000/01, due to the paucity of rain, there was a shortage of 500 million Cu.M of water compared to expectations, and that of these an effort would be made to save 200 million Cu.M, but the rest would have to be supplied through over-pumping.[21] On the basis of these figures Professor Dan Zaslavsky stated that one ought to start desalinating 500 million Cu.M of seawater per annum immediately, in order to avoid over-pumping at a rate of 300 million Cu.M, and to produce 200 million Cu.M for the purpose of artificially recharging the aquifers.[22]

[20] The State Comptroller, *Report on the Management of the Water Sector in Israel*, Jerusalem, 1990, p. 53 (Hebrew)

[21] Evidence given to the Committee by Shimon Tal, on July 1, 2001

[22] Evidence given to the Committee by Prof. (emeritus) Dan Zaslavsky, on July 15, 2001

Table No. 5: balance of the ground water reserve in the coastal basin in millions of Cu.M (main figures)

Year	Natural replenishment	Artificial recharging	Pumping	Calculated addition to reserve
1996/97	240.84	111.75	407.57	+7.31
1997/98	242.00	126.06	420.08	0
1998/99	111.72	109.94	505.36	-208.06
1999/00	219.53	127.98	542.36	-113.50
2000/01	209.50	110.00	474.00	-100.00

Source: the Ministry for National Infrastructures - the Water Commission, the Hydrological Service, *Until the Autumn of 1997*, *Until the Autumn of 1998*, *until the autumn of 1999*, and *Until the Autumn of 2000*. The figures for 2000/01 were given to the Committee by the Hydrological Service

Table No. 6: the levels of the Sea of Galilee in meters on May 1 and October 1 since 1945

Year	May 1	October 1
1945	-209.31	-211.29
1955	-210.18	-210.73
1965*	-209.13	-210.06
1975	-210.08	-211.46
1985	-209.66	-211.26
1986	-211.09	-212.33
1987	-209.57	-210.57
1988	-208.84	-209.96
1989	-210.22	-212.00
1990	-211.26	-212.59
1991	-211.95	-212.72
1992	-208.80	-209.41
1993	-208.84	-209.54
1994	-209.12	-210.73
1995	-209.01	-210.55
1996	-209.60	-211.16
1997	-210.24	-211.79
1998	-210.46	-211.96
1999	-211.76	-212.95
2000	-211.92	-213.58
2001	-213.13	-214.61
2002	-213.18	-214.88**

Based on the Ministry for National Infrastructures - the Water Commission, the Hydrological Service, *Until the Autumn of 2000*, Jerusalem, May 2001, pp. 268-270.
The figures for 2001 were received directly from the Hydrological Service and the figure for May 1, 2002 from *Ha`aretz*, which publishes the level of the Sea of Galilee on a daily basis.
The water levels that were below -211 meters in May and below -212 in October, are marked in red.
The water levels that were above -209 meters in May and above -210 meters in October, are marked in green.

* The year after the National Water Carrier started to operate
** The figure is from table No. 9 in the Ministry for National Infrastructures and the Planning Division in the Water Commission, *Master Plan (transition) for the Development of the Water Sector in the Years 2002-2010*, Final Report, April 2002, p. 29 (Hebrew).

It should be noted that the Operational Committee decided in the beginning of March 2002, that "Mekorot" will not let the water level go below -214.30 meters in 2002.

Table No. 7: the estimated water balance in 2002 in million of Cu.M, assuming that the year will be hydrologically similar to 2001

	Sea of Galilee	Yarkon-Taninim Aquifer	Coastal Aquifer	Total
Available water	105	170	250	525
Pumping by "Mikorot"	220	125	155	640
Pumping by others	95	85	195	375
Over-pumping	210	125	155	490

Based on a document, entitle “Interim Report for the Year 2001, and the Planning of the Water Supply for the Year 2002”, presented by the Director of the Water Supply Department of “Mekorot”, Sara Haklai, to the Fourth Annual Symposium on Environmental Education in the Education System, on the subject “The Water Sector in Israel, and its Ramifications in the Educational Sphere”, that took place at Beit Berl on March 21, 2002

6. The Legal Situation

6.1. The Legislation in the Sphere of Water

Most of the important laws regulating the water sector in Israel, were passed during the 1950s and early 1960s. The Water Law, which to the present day is the most comprehensive legal arrangement on the water sector, and the only law dealing with the water issue in its entirety, while laying down a general spatial policy, was legislated in 1959. Eighteen additional laws, that regulate specific issues in the sphere of water, such as the Drainage and Protection against Flooding Law of 1957, the Rivers and Springs Authorities Law of 1965, and the Prevention of the Pollution of the Sea (Dumping of Waste) Law of 1983. The last law dealing with water to have been passed, was the Water and Sewage Associations Law of 2001, that enables the local authorities to establish associations, whose main task is to provide water and sewage services to the inhabitants of the authority, in the sphere of water supply on the one hand, and the collection and treatment of sewage, on the other. Side by side with the primary legislation, there are many regulations and orders that were introduced over the years, with the intention of updating various matters, such as the level to which water may be pumped from the Sea of Galilee (1967), the method for calculating the price of water (1991), and rules for saving water in dry years (1976). In addition, since 1959, the Water Law has been amended several times in order to adapt it to the changing reality.

6.2. The Basic Principles of the Water Law

As mentioned, the only law that outlines the basic principles regarding the administration of the water sector in Israel. is the Water Law. Article 1 of the Water Law embodies the essence of the Law and the basic assumptions at its basis, and states that the water resources in the country belong to the public, are governed by the State, and are designated to fulfill the needs of its inhabitants, and to develop the country. The water resources are defined in article 2 of the law as "springs, rivers, lakes and other flows, and reservoirs of water". Even though one can interpret this instruction in a broad manner, in the instruction itself there is no mention of the sea, desalinated water, treated water or imported water.

Despite the fact that control over the water sources in Israel is in the hands of the State, it serves as a trustee of the public, since the basic assumption is that the water is meant to satisfy the requirements of the inhabitants of Israel and for the development of the country. From this principle stems the conclusion that there is no private ownership of water.

Nevertheless, the law states specifically, that every person is entitled to receive water and use it, subject to two reservations: the first reservation stems from the instruction in article 5, that prohibits the depletion of any water source, so that the right of a person to receive water from a source of water exists as long as his receiving it does not lead to the salination of the water source or its depletion. The second reservation is set in article 6, that enumerates the list of goals that establish the right to water. We are speaking of a closed list of goals, and once the goal no longer exists - the right to water expires. The goals enumerated in the article are: household uses, agriculture, industry, crafts, trade and services, and public services.

As aforesaid, the list of goals that is attached to the right to use water, is not arranged by any specific order of priorities. In 1976 the Water Regulations (the Use of Water in Rationed Areas) introduced a scale of priorities for the use of water in areas defined as rationed areas. Today one can state that almost the whole country is made up of rationed areas. On the basis of this scale, first priority is given to household uses and services. In second place - use in industry. in third place - use in agriculture, and in fourth place - other uses.

An additional principle that is interwoven all along the water laws in Israel, is its treatment as a precious good, which must be preserved. For this purpose there is a whole chapter in the Water Law that deals with: "Preserving the Water".[23] The instructions of the Water Law oblige every single person to treat the water that reaches him efficiently and with frugality, and to maintain the water installations in his possession in good order, so as to avoid waste of water. In addition, the Water Law assigns powers to the Water Commissioner to act against anyone breaking this rule, including stopping the production, or supply, or the consumption of water, which constitutes a harsh sanction, especially in light of the importance of water to human beings. The Water Commissioner is also entitled to take emergency measures to ensure the supply of water, and to prohibit access to water sources and various water installations.

In addition, article 21 assigns to the Minister of Agriculture[24], in consultation with the Water Council, the power to lay down norms for the use of water and rules for their efficient and frugal utilization, that apply to the supply of water and the consumer. As of 1964 regulations and rules have been introduced for saving water and the efficient use of water. Recently, additional regulations have been introduced, that deal with the reduction in the use of water

[23] The Water Law, Section A, article 8-20

[24] A power given since 1996 to the Minister for National Infrastructures by force of a Government resolution

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.[25] Nevertheless, there is no clear policy for enforcing these instructions, and parallel with the primary legislation and subsidiary legislation, and there is a need to lay down a rigid enforcement policy, in order to raise the awareness of the public to its responsibility regarding the state of the water sector, and to the importance of saving in the use of water.

6.3. The Water Commission

Article 138 of the Water Law authorizes the Government to appoint a Water Commissioner on the basis of the recommendation of the Minister of Agriculture (in fact, the Minister for National Infrastructures, in consultation with the Minister of Agriculture). The Water Commission constitutes an integral part of the Ministry for National Infrastructures, and the Commissioner is subject directly to the Minister for National Infrastructures.

The tasks of the Commission, according to the Law, is of extensive scope: "Administering the water affairs of the State". His powers include also planning and developing the water sector and its sources, preserving water and preventing the contamination of water. The Water Commissioner has the duty to present to the Water Council a report on his activitiesm, at least once a year. However, despite the broad authorization granted to the Water Commissioner in the Water Law, the legislation dealing with the water sector, and the reality show that the Water Commissioner is forced to share the implementation of his task with many other bodies, sometimes in order to receive their approval so that they may fulfill their duty, sometimes for the purpose of consultign them, and sometimes in order to execute the task together with them. This combination of bodies, and the requirement to consult and receive the approval of an additional supervising body, constitutes a conspicuous characteristic in the water legislation. This characteristic has resulted in decision making on water issues involving many bureaucratic procedures, that cause a waste of precious time, and make proper functioning very difficult, especially in times of crisis. (See also paragraphs 7.3.1. and 9.2.1.)

[25] Water Regulations (the Use of Water in Rationing Areas) (amendment No. 4), 2001, and Water Regulations (Rules for Washing Vehicles and Cleaning Tiled Areas with Water), 2001

6.4. The Shortcomings of the Existing Legislation

There are several problems that characterize the water laws as they exist in the legislation today. First of all, since a comprehensive legislative reform was never implemented, the water laws are scattered among various pieces of legislation, which makes it difficult to locate the regulations concerning a particular subject, and might make it especially difficult for a citizen wishing to get to know the water system, and find out what his rights and duties are as a private or business consumer. In addition, as a result of the method of legislation, that deals with different issues in different laws, issues that are of great value to the water sector, and entrench extensive powers, appear in subsidiary legislation. Clearly, regulations are open to more frequent change, in keeping with changing circumstances. However, seems as though issues, that have to do with water policy, ought to be in the primary legislation. Subsidiary legislation is also problematic because there is, frequently, no need for it to be approved by one of the Knesset Committees, and a situation whereby the public is not a real and full partner in laying down the water policy.

Since most of the legislation was laid down in the early years of the State, frequently we are dealing with legislation that no longer reflects the actual situation in the water sector. Thus, for example, by force of Government resolutions, most of the powers of the Ministry of Agriculture, that served until 1996 as the body responsible for implementing the Law, were handed over to the Ministry for National Infrastructures, but this transfer of responsibility is not reflected in the Water Law. In addition, when one reads the legislation dealing with the water laws, one may get the impression that the Water Commission has many powers, both regarding decision making, and the implementation and enforcement of the decisions. However, the reality shows that the decisions of the Water Commissioner involve complicated bureaucratic procedures, that often make his activities very difficult. (See paragraph 9.1.5.)

Furthermore, since most of the legislation was enacted by the early 1960s, it does not relate to advanced technologies, such as desalination methods and desalinated water.

7. The Background to the Crisis in the Israeli Water Sector

7.1. General

Basically, the current crisis in the water sector has not resulted from the dry years that have visited our region from time immemorial, even though it is possible that what is known as "global warming", has resulted in the dry periods being more frequent and prolonged than in the past.[26]

The crisis, as we identify it, stems from the fact that despite the hydrological reality in our region, the enormous growth in the population of Western Eretz Yisrael in the last 50 years, and the rise in the standards of living of all the various populations living in the region, the decision makers in the sphere of the water sector, were not wise enough to bring about a balance between the supply and demand for water, and enabled the over-pumping to continue since the 1960s.

The continuous failing occurred despite the fact that there exists in Israel the know-how and ability to find solutions to the problem - whether on the side of saving in the use of water, or on the side of increasing the supply of water by means of catching rain and floodwaters, purifying sewage water, desalinating brackish water, desalinating seawater, and importing water. It would appear that the crisis developed primarily because of a faulty organizational system, and decision making process.

7.2. The Historical Background of the Crisis in the Israeli Water Sector

The history of the water sector in Israel may divided into three periods. Today we are on the threshold of a fourth period. In the course of these periods the following Water Commissioners served:

[26] At this stage there is no agreement amongst the experts as to whether or not we are really in the midst of a process of drying out and desertification. Among the spokesmen who argue that indeed a process of warming is taking place, is Prof. Arie Issar (Professor emeritus from the Institute for Desert Studies at Ben-Gurion University),who presented the Committee with an article of his under the title "Climatic changes in the past, the present and the future, and their effect on the water resources of the Middle East", that will appear in a book on behalf of the Jerusalem Center for Public Affairs, which is being edited by Prof. Eliahu Rosental, *The Water in Israel and the Middle East - Policy Planning Towards the year 2020* (Hebrew)

Table No. 8: All of Israel's Water Commissioners

1959 (for several months)	Zvi Neuman
1959-1977	Menahem Kantor
1977-1981	Meir Ben-Meir*
1981-1991	Zemah Yishai
Aug. 1991 - Aug. 1992	Dan Zaslavsky
Aug. 1992 - Nov. 1996	Gideon Tsur
Nov. 1996 - Feb. 2000	Meir Ben-Meir
Feb. 2000 - July 2000	Yaacov Efrati (acting)
July 2000 -	Shimon Tal

* Meir Ben-Meir served as Director General of the Ministry of Agriculture in the years 1980-1988 - in other words, for several months he served both as Water Commissioner and Director General of the Ministry of Agriculture.

The Parliamentary Committee of Inquiry on the Israeli Water Sector was especially interested in understanding the events of the third period (1986-2000), that constitute the immediate background to the current crisis, while its recommendations for organizational and policy changes are intended for the fourth period.

7.2.1. The First Period - 1948-1964

The first period lasted from the establishment of the State in 1948, until the National Carrier was put into operation in June 1964. This was a period of massive immigration, a rapid development of agriculture (that reached in 1958 an all time peak of 13.5% of net national product[27]), and rapid construction. In these years the water planners set a goal for themselves: to find and bring about maximal exploitation of the water resources in the country, and convey hundreds of millions of cubic meters of water annually from the Sea of Galilee Southwards, in order to enable mass settlement in the Negev. Until the completion of the National Carrier project in June 1964, the water sector was based on local water enterprises, the quantity of water in use reached around 800 million Cu.M per annum, and its price, in

[27] The Central Bureau of Statistics, *Israel's Annual Statistics 1966*, No. 17, Jerusalem, 1967, p. 176 (Hebrew)

today's prices, was around half a shekel per cubic meter.[28] It should be noted that the National Carrier project was not planned on the basis of economic criteria,[29] but on the basis of the Zionist ideology of settling the Negev and making the desert bloom. In this period the Water Law of 1959 was also passed (See article 6.2.). It should be noted that the estimations regarding the natural water potential in the State in this period proved, *ex post facto*, to be unrealistic. The reports of the State Comptroller in these years dealt extensively with the water issue almost annually, but they criticized the manner in which the various activities in the water sector was being carried out, and not the basic policy behind them.[30]

7.2.2. The Second Period - 1965-1985

In the second period agriculture continued to grow, like the other economic sectors in the State, at a rapid rate. In these years it started to become apparent to those responsible for the water sector, that there was a growing imbalance between the natural water resources of the State, and the level of their consumption. However, the professional and public dialogue on solving the problem concentrated more on the subject of reclaiming sewage water (the Shafdan plan was in its first stages of planning and construction), desalination (desalination plants working on the basis of various methods were checked and/or tried out. Some of these failed on a technological basis, and others were found not to be economically viable), and the catching of rain and floodwaters (it was found that in this sphere the economic viability was limited), than on the question whether Israel could afford to maintain such an extensive agricultural sector, which was based, *inter alia*, on cheap water.[31]

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[28] Lecture by Prof. Yo`av Kislev (from the Faculty of Agriculture, at the Hebrew University in Rehovoth) at a symposium of the water associations, that took place at Kibbutz Afikim on April 10, 2002

[29] Water engineer Shaul Arlozoroff argued in a conversation with the Committee's representative on November 8, 2001, that *ex post facto*, it might be possible to show that the project was actually economically viable

[30] For example, in pages 122-143 of *The State Comptroller's Report No. 13*, that was published in 1963, the State Comptroller dealt extensively with criticism of the actual implementation of the national water enterprise

[31] In the mid 1970s agriculture used 80% of the sweet water in the country, and there was already talk that the price of water should reflect its cost. However, the debate was still at its early stages. See for example The Committee for Examining the Principles of a Development Policy for the Water Sector, Summation and Recommendations, Jerusalem, March 1975, that presents the recommendations of the Yaacobi Committee for Examining the Subsidiary Legislation for Water Prices in the State, of 1971, in pp. 20-31. (The document was presented to the representative of the Committee by Menachem Kantor)

In the State Comptroller's Report for 1966, the first warning regarding over-pumping appeared. *Inter alia* the Report stated:

> "The growing exploitation of the water resources, now reaches more than 80% of the total potential quantities of natural water in Israel. The annual average potential is estimated at around 1.5 billion Cu.M of water, and the production of sweet water in 1964/65 reached 1.23 billion Cu.M. Such a high rate of exploitation, which has been going on for years, unavoidably leads to over-pumping in some of the sources... The over-pumping of water results in the salination of the wells. The over exploitation, on the one hand, and the expected increase in the population and the consumption of water in homes, agriculture and industry, on the other hand, make an increase in the water production capacity necessary, already in the coming years. The planners have calculated that the necessary addition is 324 million Cu.M per annum.
> In order to ensure the supply of the necessary quantity of water, without having to resort to over-pumping, which can offer a solution for a very limited period only,[32] the factors dealing with the water sector - the Water Commission, "Tahal" and "Mekorot", are acting to develop the remaining water resources... Even after the exploitation of the remaining natural resources, with all the difficulties and major investments involved, the State will not have at its disposal sufficient water, and the gap between the quantities being produced and the demand will continue to grow, reaching, according to Tahal's calculations, 364 million Cu.M per annum in 1980... The supply of water from artificial sources requires a tested production process for large quantities at a reasonable price, and means to finance the required large investment. With respect to the various methods for creating water from artificial sources, the factors acting in the water sector pointed in one direction, which is the desalination of saltwater..."[33]

It should be noted that in this period, that included the Six Day War (1967), the Yom Kippur War (1973), the "political upheaval"[34] (1977), and the Lebanese War (1982), constituted a transitional period for Israel both in terms of values and ideology, and this manifested itself also in the sphere of the approach to the water sector. One of the results from this change was a major decline in the development budgets for the water sector, starting in the period in the early 1980s when Yoram Aridor served as Minister of Finance. Whereas in 1980 the development budget of the Water Commission was 70 million dollars (of which 10 million were fixed expenditures) in 1986 it was only 30 million.[35]

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[32] The solution "for a very limited period" is still in force 36 years after this report was written

[33] The State Comptroller, *Annual Report No. 16*, Jerusalem, 1966, pp. 283-284 (Hebrew)

[34] This refers to the first ever electoral victory of the Likud in 1977

[35] See, for example, report by journalist Amiram Cohen, "They filled their mouths with water", *Al Hamishmar*, August 22, 1986

7.2.3. The Third Period (1986-2000)

The third period opened with the dry years of the mid-1980s, and the implementation of the Economic Stabilization Plan of the National Unity Government in 1985 (which, *inter alia*, led to a serious crisis in the various frameworks of the agricultural settlement), and ended with the Government resolution to prepare the first tenders for seawater desalination and water importation, with special emphasis being placed on the increase of the role of business factors in the development of the water sector. In the course of these years:

* There were three periods of drought and serious shortages of water - 1985-86, 1989-91 and 1999-2000 (which continued in 2001);
* Two master plans for the development of the Israeli water sector were published (1988 and 1997), as well as a plan for the organization of the water sector (the Arlozoroff Report of 1997), and several reports on effluents and other specific issues;
* Overall responsibility for the water sector was transferred from the Ministry of Agriculture to the Ministry for National Infrastructures (in 1996), the number of Ministries dealing with various aspects of the water sector increased, and numerous resolutions were passed by the Government regarding water;
* Three Knesset committees made recommendations regarding policy changes. The joint sub-committee of the Knesset Finance and Economics Committees on water prices was canceled;
* Of the three pillars of the administration of the water sector in Israel, the Water Planning Company of Israel - "Tahal" - was privatized, "Mekorot" entered an organizational and financial crisis from which it hasn't extricated itself to the present day, and the power of the Water Commission has dwindled;
* A debate about fundamentals developed between the economists and the Ministry of Finance on the one hand, and the farmers and Agricultural lobby, on the other, on the subject of water for agriculture;
* Talks began about regional water plans, within the framework of the peace process in the Middle East.

However, nothing essential changed - the over-pumping continued, the state of the reservoirs deteriorated (even though the bountiful rains of the winter of 1991/92 temporarily alleviated the situation), the danger of the contamination of the water sources grew, the arguments continued and it looked as if no one in the political and professional systems had the wish or the power to contend seriously with the complex of problems.

7.2.4. The Beginning of the Fourth Period

the fourth period opened with the first tenders for the construction of seawater desalination plants under BOT (build, operate, transfer) and BOO (build, operate, own) contracts, and for the importation of water from Turkey, and continued with various emergency measures taken to start dealing with the expected water shortage.

In June 2001 the Parliamentary Committee of Inquiry on the Israeli Water Sector was set up, in order to investigate the causes for the crisis, and make recommendations regarding the actions that the Government must take in order to deal with the emergency situation, and in order to pull out of the crisis. (See chapter 2)

Since June 2001 there have been several important developments. On March 29, 2002, the Ministry of Agriculture and Rural Development and the Ministry of Finance signed a document entitled "A New Agricultural Policy - a Reform in the Water Prices" - a document dealing with the gradual equalization of the water prices paid by the farmers to those paid by the other sectors in the economy, while compensating the farmers by means of a subsidy for the utilization of land for agricultural purposes (or as stated in the document: "support for the preservation of agricultural areas"). The document was approved by the Government on the following day.[36] In the beginning of April 2002 the Government approved a plan for the desalination of 400 million Cu.M of seawater per annum.[37] But most important of all, in April 2002 the Planning Division of the Water Commission published its "*Master plan (transition) for the Development of the Water Sector in the Years 2002-2010"*, which was prepared at the initiative of the Minister of National Infrastructures. The plan tries to contend with the complex of problems facing the water sector. (See chapter 8)

7.3. The Organizational Structure and the Decision Making Process

The multiplicity of Ministries as well as Government and public bodies dealing with water issues, has constituted a problem since the establishment of the State, and as the years have gone by, so their number grew. Today there are Ministries dealing with the water issue by law, others that deal with the water issue for functional reasons, and yet others who deal with it because of various interests. The multiplicity of Ministries, and the absence of a clear hierarchy amongst them, in so far as determining the policy regarding water is concerned, frequently causes not only duplicities and/or conflicts, but also difficulties in determining a

[36] Government resolution No. 1740 of April 28, 2002

[37] Government resolution No. 1682 (se/32) of April 4 2002

clear and coherent policy, and in implementing Government resolutions on the subject. Prof. Avishai Braverman described the situation in the following words:

> "Israel's failure is a systemic failure. Israel has reached a situation in which it is a state that is incapable of operating for the implementation of public projects... One reason for why we have reached this situation, is that we have a bureaucratic hell. We have so many Ministers, and so many persons who are in charge, that no one manages to cut the 'Gordian knot'".[38]

7.3.1. The Ministries Dealing with the Water Issue[39]

The Ministry for National Infrastructures was established in 1996. Upon its establishment, it received from the Ministry of Agriculture responsibility for the water sector, except for those issues for which other Ministries were responsible. It also given, by the Ministry of Agriculture, the Water Commission and the Sea of Galilee Administration. The Ministry for National Infrastructures is supposed to have decisive influence on laying down Israel's water policy, and it is responsible for representing the subject *vis-á-vis* the Government and to introduce regulations related to it. However, the other Government Ministries are able to stand in its way, as can the Knesset Finance Committee and Economics Committee. It should be noted that the Water Law still does not recognize the Ministry for National Infrastructures as being responsible for the water sector, and the powers and responsibilities that were transferred to it, were transferred by force of a Government resolution only.
In June 2001 an Emergency Staff for the water sector was set up within the framework of the Ministry for National Infrastructures. The main task of the Staff is to meet on a weekly basis. Its meetings are chaired by the Minister, and attended by representatives from all the Ministries and bodies concerned. It is supposed to take decisions at the micro level, and follow up their implementation, and, if necessary, to discuss issues at the macro level.

The Ministry of Agriculture was responsible for the water sector from the establishment of the State and until 1996, when the Ministry for National Infrastructures was established. Today the Ministry is responsible for the distribution of the water quotas to agriculture, and

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[38] Evidence given by Prof. Avishai Braverman (President of Ben-Gurion University) to the Committee, on July 30, 2001

[39] The information in this section is based, *inter alia*, on Dalia Harel, Dr. Joseph Dreizin and Nathan Meir, *Water as a National Resource - an Integrative Approach*, Tel-Aviv, December 1999 (Hebrew), and on El'ad van Gelder, *Distribution of Authority in the Water Sector*, Jerusalem, the Knesset Center for Research and Information, September 11, 2001 (Hebrew)

the water prices for agriculture . Since agriculture is still the largest consumer of water (sweet water, brackish water and effluents), it is almost impossible to change anything in the water policy without the cooperation of the Ministry, which, to a certain extent, represents the interests of the farmers. It was the Minister of Agriculture who initiated the agreement signed between the Ministry of Agriculture and Rural Development and the Ministry of Finance, and approved by the Government at the end of April 2002, regarding a far reaching reform in the prices of water for agriculture - a reform that opens a new era in the water sector. (See article 9.5.)

The Ministry of Finance plays a central role in the water sector by means of two of its divisions: the Budgets Department, which is able to approve or deny budgets to the various Ministries that deal with water and "Mekorot" (see paragraph 9.2.5.), and the Accountant General's Department, which controls all Government expenditure in the sphere of water, and is responsible for issuing Government tenders. (See for example paragraph 9.6.1. regarding the tenders for the desalination of seawater and paragraph 9.6.4. regarding the tender for the importation of water from Turkey). The Ministry of Finance has played over the years a central role, which has not always been constructive, in the struggle to cancel the water quotas for agriculture and the subsidization of agriculture by means of the water prices, and in laying down the time tables and conditions for developing sewage treatment plants and the beginning of wide scale seawater desalination in Israel. Since the 1970s the Ministry of Finance has led the debate in favor of managing the water sector on a purely economic basis - in other words, on the basis of the principles of supply and demand.[40] In a certain sense one may view the approach of the Ministry of Finance to the water issue as being based on narrow accountancy principles, that do not take into consideration non-economic interests, such as ideology or foreign policy interests.
Within the framework of the leading role played by the Minister of Finance in the Ministerial Committee for Social and Economic Affairs, that deals, *inter alia*, with the water sector, he can have a major influence on the resolutions adopted by the Government on the subject.

The Ministry for the Environment was set up in 1991, and was given responsibility for all issues concerning the preservation of natural resources and the prevention of pollution, including the contamination of water and the treatment of sewage. From the Ministry of Agriculture it received responsibility over the quality of the water, watching over rivers, the

[40] See for example David Bo`az "Prices as distorters of the allocation of water in the economy", *The Economics Quarterly*, Vol. 23, No. 91, December 1976 (Hebrew), and Ran Mosinson, *The water sector budget - a comprehensive and multi-annual approach*, Jerusalem, the Budgets Department in the Ministry of Finance, October 1986 (Hebrew)

Local Authorities and Sewage Law, and the River and Springs Authorities Law. From the Ministry of Health it received responsibility to deal with sewage, except for laying down standards and approving plans. Despite the aforesaid, it should be noted that the powers of implementation in all these spheres are in the hands of the Water Commission.

The Ministry of Health is responsible for the quality of potable water, and a proper separation of sewage from potable water. The Ministry also lays down the rules for irrigation with effluents, in order to protect the potable water drillings, and the sea from pollution by sewage, and in order to supervise the quality of fruits and vegetables irrigated with effluents.

The Ministry of the Interior deals with issues connected with water within the framework of its responsibility regarding the local authorities, and everything connected with the sewage network, sewage treatment plants and reservoirs. The Ministry of the Interior is also able to prevent approval of building plans for 200 housing units or more, before the sewage issue is taken care of..

The Ministry of Science, Culture and Sports is responsible, *inter alia*, for encouraging research in the spheres of water and the environment. Despite the paucity of the resources at its disposal, the Ministry attempts to develop awareness for the need to increase Government financing for research in the sphere of water, that fits into the agenda of the water sector planners in Israel. (See article 9.11)

The Ministry of Industry and Trade, the Ministry of Housing and Construction, and the Ministry of Tourism, all touch on water issues related to the spheres under their responsibility.

The Ministry for Foreign Affairs played an active role in the past in the sphere of water, in connection with the mediation efforts of the United States between Israel and its neighbors regarding the distribution of the Jordan River waters, and American and other foreign assistance in the development of the water sector in Israel. Since the Madrid Conference in October/November 1991, the Ministry for Foreign Affairs has been a partner in all the multilateral and bilateral regional cooperation activities regarding water issues - not always in full cooperation with the other factors in the economy, that deal with the water issue.

The Ministry of Defense was and remains, to a certain extent, involved in the issue of the water supply to the Palestinians and the Jewish settlers in Judea, Samaria and the Gaza Strip. The Ministry of Defense also has a clear interest that the State of Israel should reach an

agreement with the Government of Turkey regarding the importation of water from this country. (See paragraph 9.6.4.)

The Prime Minister's Office can be involved in issues connected with water, and can influence the policy in this sphere, both inside the country and on the international level, in so far as the Prime Minister is interested in the issue. Several months ago a committee for the removal of blockages in the water sector was set up within the framework of the Prime Minister's Office, headed by the Deputy Director General of the Office, and in March a team of Director Generals was established, headed by the Director General of the Prime Minister's Office, to examine all the options regarding the issue of the importation of water from Turkey.

The Ministry for Religious Affairs is involved in the water issue when it insists that water should not be pumped from the Sea of Galilee into the National Water Carrier two months before Passover, for reasons of Kashrut.[41]

There are at least four bodies by means of which coordination among the various Ministries on the water issue is supposed to take place:

1. The Ministerial Committee on Social and Economic Affairs, headed by the Prime Minister, in which policy decisions on the strategic level are adopted.
2. An inter-Ministerial team, headed by the Director General of the Ministry for National Infrastructures, which was established following a Government resolution of April 2001, in order to push ahead various issues that the Government had decided upon,[42] which operates as The Emergency Staff for the Water Sector, headed by the Minister for National Infrastructures.
3. An inter-Ministerial team, headed by the Director General of the Prime Minister's Office, which was also established following the Government resolution of April 2001, which operates as the Committee for the Removal of Blockages in the Water Sector[43] headed by the Deputy Director General in the Prime Minister's Office.
4. A team of Director Generals, headed by the Director General of the Prime Minister's Office, on the issue of the importation of water from Turkey.

[41] Statement by Dr. Yossi Dreizin at a symposium on behalf of the Water Commission regarding the Master Plan for the development of the Water Sector, that took place at the agricultural compound in Beit Dagan on January 30, 2002

[42] Government resolution No. 1115 (SE/2) of April 18, 2001

[43] The intention is to deal with problems that prevent the adoption of decision in the water sector

7.3.2. Additional Bodies Active in the Israeli Water Sector

On top of these Government bodies, that deal with the water issue in Israel, there are additional bodies that fulfill staff and implementation functions in the sphere of water in Israel:

The Water Commission, which operates within the framework of the Ministry for National Infrastructures, performs a central role in the sphere of laying down the water policy of Israel, and concern for its implementation. The powers of the Water Commission, and the person standing at its head, are designated to them by the Water Law (See article 6.2.), and the Water Commissioner is responsible for implementing the law. Amongst the powers of the Water Commission under the law: preserving the water sources, that according to the Law are owned by the State; preventing the contamination of the water; laying down norms and rules for the use of water; and authorizing associations to set up and operate national and regional water enterprises. Despite his many powers under the law, the hands of the Water Commissioner are frequently tied at the implementation stage, and this due to the multiplicity of authorities that deal with the issue. The status of the Water Commissioner was also damaged because in the past not all the Commissioners were appointed on a professional basis.[44] (See also paragraph 9.2.1.)

"Mekorot" is a company founded in 1937 by the Histadrut (trade union association), the Jewish Agency and the Jewish National Fund (JNF), in order to construct water projects for the Jewish Community. Since the establishment of the State "Mekorot" has operated as a Government company. Over the years it constituted one side in the Commission-"Tahal"-"Mekorot" triangle, that together ran the water sector of Israel, until it was decided to privatize Tahal (see below). "Mekorot" is responsible for the supply of over 60% of the water in the country, including almost all the urban consumption, while the rest is produced by water associations and private producers "Mekorot" is also responsible for the national water pipeline system, runs the National Carriers, constructs and operates small plants for the desalination of brackish water in various parts of the country, and of seawater in Eilat (that started to function in 1997), as well as regional sewage treatment systems, the largest of which is the Shafdan plant.
Today, despite the unclear organizational and financial future of the company, "Mekorot" is struggling, in face of opposition by the Ministry of Finance, for its right to be a partner in the

[44] In all the evidence heard by the Committee, there wasn't a single witness who took issue with the professionalism or the lack of partiality of the current Water Commissioner (Shimon Tal)

construction of large seawater desalination plants, additional desalination plants for brackish water, and a system for reclaiming and conveying effluents, side by side with business factors. It is currently in an advanced stage of issuing a tender for the construction of a desalination plant near the power station in Ashdod under the Turn Key method (See additional information on the subject of "Mekorot" in paragraph 9.2.5., and on the desalination plant in Ashdod in paragraph 9.6.1.)

"Tahal" - Hebrew acronym for the Israel Water Planning Company - was from its establishment in 1952 and until its privatization in 1996, a Government company that dealt with planning the Israeli water sector, and was responsible for preparing master plans for it. Since its privatization, "Tahal" has continued to assist the Water Commission by invitation, but most of its activities these days are abroad.

The Water Council is a statutory body set up in order to advise the responsible Minister on water matters. Today it has a structured majority that supports the positions of the farmers (For additional information on the Water Council see paragraph 9.2.4.)

In addition, the following bodies operate in the sphere of the water sector the Geological Institute, the Water and Sewage Authority, the National Council for Drainage and Drainage Authorities, River Authorities, the Sea of Galilee Administration, the District Committees for Planning and Construction, the Local Government Center, the Association of Israeli Farmers, the JNF, the Court for Water Matters (the Haifa District Court), etc.

7.3.3. Government Resolutions

If the state of the water policy in Israel were determined on the basis of the number of Government resolutions adopted on the subject, the situation would be excellent. The Committee counted several scores of resolutions on the water issue, adopted by the Government since mid-1989.[45]

Most of the resolutions dealt with specific matters - such as the emergency situation in the water sector in 1990, the transfer of powers to the Ministry for the Environment, a change in the way water prices are calculated, the privatization of "Tahal", the imposition of production levies on private producers, the establishment of water and sewage associations in the local

[45] The Committee is grateful to the Government Secretariat for supplying it with all the relevant Government resolutions

authorities - rather than overall policy. Many of these resolutions were implemented, though not always immediately.[46] Other resolutions weren't implemented at all, or were only partially implemented. The Budgets Department in the Ministry of Finance found that of the many resolutions adopted in the last decade regarding the updating of water prices and the fixing of production levies on water sources, about a quarters were not implemented, about a third were only partially implemented, and of six resolutions adopted between the end of 1999 and the end of 2000 regarding saving of water, three were partially implemented and three were not implemented at all.[47]

Of the resolutions that were not implemented was a Government resolution of September 1992 regarding the establishment of an Authority for the Planning of Water Resources[48], and a resolution dealing with the structural reform of "Mekorot".[49] On the other hand, since 1999, the Government has adopted important resolutions that have been implemented in full on such issues as seawater desalination, and the enactment of the Water and Sewage Associations Law of 2001.

The problem of Government resolutions that are not implemented is not new, and does not arise only in connection with water. The question as to why many Government resolutions are not implemented, and recommendations for ways to improve the situation, deserve a separate discussion.[50]

7.3.4. State Comptroller Reports and Knesset Decisions

As aforementioned, the State Comptroller's reports, since the establishment of the institution of State Comptroller in Israel in 1949, have dealt extensively with water issues, with most of the criticism focusing on the implementation of policy, and only part on policy (or the absence thereof). From the State Comptroller's reports regarding the correction of faults dealt

[46] For example, the resolution to cancel the Equalization Fund - Government resolution No. 1151 of December 25, 1989, was implemented only nine years later!

[47] Material presented to the Committee by Erez Yamini of the Budgets Department in the Ministry of Finance

[48] Government resolution No. 149 of September 8, 1992

[49] Government resolution No. 733 (EC/15) of November 13, 1996

[50] On the subject of the problems in the sphere of decision making, and the implementation of decisions in Israel see, for example, Yehezkel Dror, *A Memorandum for the Prime Minister, B' - to Build a State*, Jerusalem, the Jerusalem Institute for Israel Studies and the Akademon - the publishing house of the students union of the Hebrew University, 1989 (Hebrew)

with, we learn that as in the case of other issues dealt with by the Comptroller, only a minority of the issues were subsequently treated and repaired.

Of the reports in the last 15 years, three were especially grave in their findings. The first was the Report of 1987 by State Comptroller Yaacov Meltz, which *inter alia* stated:

> "For many years there was over-pumping of large quantities from the underground reservoirs. As a result today a total quantity of around 2 billion Cu.M - a quantity equal to the total annual consumption of the country, is missing In this way the whole operational reserve of the Coastal Reservoir and the Mountain Reservoir, which are the main water reserves of the country, has been exploited. The exploitation of the water from the reservoirs was done on the basis of the whole water potential of the country, without taking into account, that part of it hasn't yet been realized. The water potential is defined as that quantity that can be produced, on an annual average, without damaging the water sources. The potential includes floodwater and reclaimed sewage water as well, part of which is not available at this stage, since the intallations for their storage or treatment have not yet be constructed, so that they are not available to the system. The quantity of available water of the total potential, which can be allocated without damaging the reservoirs, was in each of the last 8 years smaller by 200-300 million Cu.M than the potential...
> The allocation of a quantity of water, which is greater than the quantity of water available in practice, is the cause of the over-pumping and the depletion of the water resources, and especially the under ground reservoir of the coastal plain, and the deterioration in the quality of water in them. The underground reservoir of the coastal plain has been operated in a manner that endangers its future...
> Many reports regarding the state of the water sector have been presented from 1970 to the present day to the Water Commissioners, and the Minister of Agriculture by many expert committees, that were appointed by them for this purpose. In their recommendations, all these committees dealt unequivocally with the over exploitation of the reservoirs, the deterioration in the quality of water in them, and the need to rehabilitate them. The committees also recommended a cut in the water quotas for agriculture, and the increased use of inferior water for irrigation, while pointing out the need to bring the prices of water as close as possible to their real production cost. The control revealed that the recommendations were not implemented. The over-pumping continued for many years, and in 1986 the water sector reached a crisis, that necessitated an urgent cut in the quotas...
> To the present day the Water Commission has not prepared a comprehensive master plan for the water sector in the country, dealing with all its components - the economic aspects, the development of sources, their operation, their preservation, the distribution of water and its marketing, the exploitation of inferior water and its use - a plan that will enable the conservation of the water sources, allocate them economically, and prevent their waste..."[51]

The second grave report was the Special Report by State Comptroller Miriam Ben-Porath, concerning the Administration of the Water Sector in Israel, that was published in December 1990. *Inter alia* the Comptroller stated in her conclusions:

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[51] The State Comptroller, *Annual Report No. 37*, Jerusalem, 1987, pp. 543-4 (Hebrew)

> "The irresponsible management of the water sources for the last 25 years, has caused the liquidation of Israel's water reserves, and grave damage to their quality. Over-pumping from the reservoirs over the years caused a most serious hydrological deficit (around 1.6 billion Cu.M, in the three main reservoirs in the country, as of the end of 1990). In fact, the country does not have any water reserves in its reservoirs... The Water Commission was accustomed for years to allocate a larger quantity of water than that available. The over-pumping completely depleted the water reserves in the reservoirs (the operational reserve), that were meant to cover temporary shortages, resulting from one or two dry years... For the first time in 1990, the red lines in the Mountain Reservoir - which is today the main mutli-annual reservoir in the water sector, and a source of potable water for most of the large cities... - were crossed"

Later in the Report the Comptroller spoke of the agriculture:

> "The serious condition of the water sector is not properly manifested in the plans of the Ministry of Agriculture for the future development of agriculture in the State... In the opinion of the State Comptroller, it is necessary to prepared soon a master plan for the development of the agriculture in the short and long runs - a plan that will take into consideration the quantitative limitations of the use of water in agriculture in the coming years... The low selling price of water to the agricultural sector is, to a large extent, the cause of the constant deterioration in the water sector, and grave distortions in the agricultural sector. The low price enables the continued existence, and even the continued development, of agricultural crops, that not only fail to contribute to the national economy, but cause it significant economic damage, in addition to the damage caused by the over-pumping from the reservoirs... The way in which the water sector is being managed, is a concrete example of the shortsightedness, or excessive focusing on immediate needs, occasionally based on irrelevant considerations... The crisis in the water sector is not the result of natural causes, but man made... In order to put order in the water sector, it is necessary to transfer the responsibility for running it into the hands of a national, professional and neutral body, that will take the requirements of the national economy, including the agricultural sector, into account, and will ensure the quality of potable water for homes, and the future supply of water in a regular and credible way".[52]

The third report was the State Comptroller's Report No. 44 for 1993, which dealt with the organizational aspect of the water sector. And this is what the State Comptroller, Miriam Ben-Portath, said in her conclusions:

> "So far no comprehensive and binding policy has been formulated for the administration of the water sector in the country, a multi-annual plan has not been prepared, and rules for approving the construction of water enterprises, have not been laid down.
> The construction of water projects involves prolonged processes - decision making regarding the construction, the planning and approval of the plans. When the Water Commission decides to construct water enterprises, it must act in accordance with a multi-annual plan, and approval procedures laid down in the Water Law.
> The practice of "Mekorot" to start constructing water enterprises without first receiving all the approvals required by law, while trying to justify this on the basis of urgent needs, frequently involves additional costsl, that fall on the shoulders of the consumers and the State budget. This situation is unbearable.

[52] The State Comproller, *Report on the Management of the Water Sector in Israel*, Jerusalem, 1990, pp. 53 -56 (Hebrew)

> According to the Water Law, the Water Commissioner is in charge of running the water sector in the State. *Inter alia*, it is his duty to direct the development of the water enterprises, control their planning, and supervise their construction. A correct management of the water sector requires a separation among the planning factor, the executor, and the supervisor over the execution. This is not done. The Water Commission used to hand over most of the works for constructing water enterprises to "Mekorot", and their planning to "Tahal". Since the Commissioner has only limited manpower at his disposal for the purpose of development, the Water Commission became dependent on "Mekorot" and "Tahal". However, these bodies are driven by considerations, such as operational and organizational ones, that don't always tally with the requirements of the economy.
> In October 1992 the Government decided that a bill should be prepared for the establishment of a national authority for the planning of water resources, with the goal of improving the professional and administrative capability of the Water Commission in the sphere of development. By the time that this control was completed, no bill had been presented, and the authority was not established. Those concerned ought to act to establish it.
> In the opinion of the Comptroller, the Water Commission should act to separate the planner from the executor, and from the supervisor over the execution. It should increase the number of executors and create competition. In this way the dependence of the Water Commission on "Mekorot" "Tahal" will decline, and it will be possible to make the system dealing with the development of water enterprises more efficient, and reduce the cost of their construction".[53]

The treatment of the State Comptroller's special report on the management of the water sector of 1990, is symptomatic of the Government's attitude to State Comptroller reports in general, and criticism on the issue of the water sector in particular. The Report raised much comment in the media, and following its publication the Knesset State Control Committee, headed by MK David Libai, held seven hard and merciless meetings in the first six months of 1991. However, when the meetings came to an end, nothing happened. Why? Because in the meantime the Government had changed, the Minister of Agriculture had changed and the Water Commissioner was replaced. The only thing that did not change was the lack of contention with the crisis.

The fate of the decisions and recommendations of the statutory and special Committees on issues connected with the water sector, over the years, was not much different. The Government's attitude to the possible contribution of the Knesset to determining the water policy was expressed, very bluntly at the end of 1967, by Prime Minister Levi Eshkol, in an answer to a motion for the agenda by MK Binyamin Avniel, on the seawater desalination issue:

> "(Member of the Knesset Avniel) proposes that one of the Knesset committees should deliberate the issue. It is difficult to assume that in such a committee, or in the Knesset as a whole, there are to be found the most brilliant geniuses among the experts on these

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[53] The State Comptroller, *Annual Report No. 44*, Jerusalem, 1994, pp. 504-5 (Hebrew)

> issues, who are masters of decision, while in the professional committees (appointed by the Prime Minister), who deliberate the issue, are to be found people who are incapable of deciding... When the Government will be close to adopting a decision on the issue, the matter will be brought for deliberation to one of the Knesset committees. As a matter of fact, we shall be interested that it shall also bear part of the responsibility".[54]

Nevertheless, from time to time decisions were adopted by Knesset committees, that were referred to the Ministers concerned for reaction. No practical reaction was ever received to any of these decisions. This is what happened in the case of the conclusions issued by the Economics Committee after it held two deliberations on a motion for the agenda by MK Joseph Tamir on the water shortage, raised on November 28 1979; this is what happened with the conclusions published by the Economics Committee, chaired by MK Shoshana Arbeli-Almoslino, in July 1990, following three deliberations on the issue of the crisis in the water sector (this was before the publication of the special State Comptroller report); this is what happened with the report of the Subcommittee of the Finance Committee on Water Desalination, headed by MK Gershon Shafat, that presented its conclusions on March 17, 1992; and this is what happened in the case of the recommendations of the State Control Committee, headed by MK Uzi Landau, that were published in January 2000, after the Committee held two long deliberations on the issue of the state of the water sector.[55]

7.3.5. Master Plans and Experts' Reports

Master plans and reports ordered from experts on the water sector in general, or specific topics, are supposed to constitute the basis for a balanced policy. However, it would appear that at least in the case of water, the fate of most of the master plans and expert reports has been to gather dust on shelves.[56]

Why has this happened? The head of the Planning Division in the Water Commission explained that this usually resulted from two causes: the one, that while the instructions were

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[54] Reply by Prime Minister, Levi Eshkol, *the Knesset Record*, Vol. 50, December 20, 1967, pp. 497 & 499

[55] The recommendations of all these committees were published in full as an annex to the report in Hebrew

[56] In the early years master plans were apparently taken more seriously. In a lecture given during a symposium held by the Water Commission on the new master plan for the development of the water sector, on January 30, 2002, Shmuel Kantor related, that when he participated in the preparation of the master plan for the development of the water sector some time before the establishment of the State, there was a major debate as to the timing of the construction of the national water enterprise, from the Sea of Galilee southwards - whether to advance it as a basis for all other activities or on the contrary, delay it for as long as possible. This debate was decided.

given to the planner or examiner, they were very detailed, and were based on a particular policy. However,

> "By the time the planner presented the plan, the decision makers changed, or the policy changed. The result was that when the plan was presented as a product... it suddenly transpired that it was irrelevant... (In addition) the plans were very rigid, were presented on paper, and were prepared with conventional tools, so that if it was necessary to adapt it to policy changes, or different directions of thought to those that prevailed when work on the plan began, it would have taken a relatively long time to do".[57]

The Committee saw and heard about various historical plans and reports, but it concentrated on the period since 1986, and in particular on plans and reports dealing with the water sector as a whole - not those that dealt with specific aspects of the water issue. The first important document in this period was the Master Plan of 1988, that was prepared by "Tahal" for the then Water Commissioner, Zemah Yishai, following the 1987 State Comptroller Report (see paragraph 7.3.4.). The main recommendations of the plan dealt with the following issues:

1. Long term water allocations for the various sectors of the economy, and the immediate need to prepare for changes in the allocations for agriculture, both in terms of quantity and quality, from those prevalent today;
2. The production policy from the natural sources, and especially cutting down production from the Coastal Aquifer;
3. Orders of priority for investment in the water sector;
4. The scope of investments necessary in the water sector in future, which would be much larger than the investments in recent years;
5. Principles for ensuring the quality of potable water: supply from ground water, prevention of cross connections between the sewage and the potable water systems, and preventive disinfecting.[58]

The plan was shelved, primarily because it proposed cuts in the quantity of sweet water allocated to agriculture in 1988, from 1.2 billion Cu.M to about 740 million Cu.M in 2000.[59] Following this conclusion, the Director of the Planning Authority in the Ministry of Agriculture wrote to "Tahal", that after a reexamination of the data, the Ministry had concluded that it is possible to ensure the supply of sweet water to agriculture in 2000, at a

[57] Lecture by Dr. Yossi Dreizin at the symposium held by the Water Commission on the new master plan for the development of the water sector, on January 30, 2002

[58] Letter from the steering committee of the project of the master plan for the water sector to the Water Commissioner of November 7, 1988, regarding the main recommendations of the master plan

[59] "Tahal", *Master plan for the Water Sector*, Volume a, conclusions, Tel-Aviv, October 1988, p. 9 (Hebrew)

rate of 1.3 billion Cu.M per annum, including desalinated water, and therefore he does not accept the recommendations of the planning team.[60] It should be noted, that the Master Plan avoided recommending projects for the desalination of seawater, due to doubts regarding their feasibility both on economic and technological grounds.[61] In the words of the Water Commissioner at the time, Zemah Yishai: "I assigned to 'Tahal' to prepare the Master Plan, it prepared the plan, we never shelved it... but the subject never came up for deliberation".[62]

In 1994, at the request of the Water Commissioner Gideon Tsur, "Tahal" prepared a new master plan, that was once again updated in 1997. The new master plan presented three scenarios regarding the quantity of water that would be available in 2000, 2010, 2020, and 2040, and two basic approached to policy - one, that the document termed "business as usual", and according to which decisions are taken on an administrative basis, while taking of security and social aspects into account, and one purely economical. The plan presented two policy proposals, that were based on the different basic approaches, in a situation of an intermediary forecast regarding the water potential:

Table No. 9: part of the 1997 Master Plan

	Activity	**Policy**	
		"Business as usual"	**Economic approach**
1.	An expected volume of agricultural activity in 2020	Around 1.1 billion Cu.M	Around 0.8. billion Cu.M
2.	Start of planning of desalination system	Immediately	Can be delayed
3.	The year desalination starts opeating	2005	2015
4.	Annual investments in the water sector in the coming decade	0.8 billion shekel per annum	0.6 billion shekel per annum
5.	Investments in the implementation of desalination until 2020	NIS 2.8 billion	NIS 1.4 billion
6.	Disposal of unused effluents (directly or indirectly into the sea)	Marginal and terminating	Exists with regards to whatever is not used in agriculture
7.	Support of sweet water prices	Inclination to preserve in agriculture at a volume of no less than 1.1 billion Cu.M	Inclination to get rid of the support as soon as possible
8.	Support of prices of sewage effluents	To encourage use	To achieve hasty liquidation of support

"Tahal", *Master plan for the Water Sector*, Tel-Aviv, the Ministry for National Infrastructures - Water Commission, March 1997, p. IV

[60] Evidence given by former "Tahal" director Yehoshua Schwartz to the Committee, on September 24, 2001, and interview with Prof. Hillel Shuval (from the Department of Environmental Sciences at the Hebrew University) held by the Committee's representative, on February 3, 2002

[61] *Master plan for the Water Sector*, op. cit. p. 16

[62] Evidence given to the Committee by Zemah Yishai, on July 9, 2001

The plan was presented to the new/old Water Commissioner, Meir Ben-Meir, who shelved it soon after reentering office following the 1996 elections, without explaining his decision.

In 1995 Minister of Finance Avraham Beiga Shohat, Minister of Agriculture Ya'acov Tsur, and the Water Commissioner Gideon Tsur appointed the Committee for Examining the Management of the Supply of Water in Israel, headed by Shaul Arlozoroff. Shohat explained to the Committee of Inquiry, that the background to the establishment of the Arlozoroff Committee were incessant arguments regarding the price of water, with the Minister of Finance arguing that it is necessary to raise the price of water, and the farmers and Ministry of Agriculture objecting.[63]

The Arlozoroff Committee presented its report to the new Government: to Minister for National Infrastructures Ariel Sharon, Minister of Finance Dan Meridor, Minister of Agriculture Raphael Eitan, and Water Commissioner Meir Ben-Meir, in April 1997. The Committee's main recommendations were:

1. An improvement in the hydrological management, by using the economic method rather than the administrative method as the means of allocation;
2. Use of economic tools to bring about a diversion of sweet water from agriculture to the city, and assistance for the farmers that will be hurt as a result of this process;
3. Raising the prices of water for agriculture by 80% over several years, under the assumption that every increase of 8% would result in a saving of 4-5% of the quantity of water consumed by agriculture;
4. Increasing the use of treated effluents and brackish water in agriculture;
5. Putting off the construction of seawater desalination plants until after the potential for diverting water from agriculture is exhausted.[64]

The Committee also dealt with changes in the water sector, in order to decrease the centralization in it, and the reorganization of the water sector - especially by strengthening the Water Commission and regulating the status of the bodies dealing with production, supply, water treatment or water reclamation.

Ben-Meir did not conceal his rejection on principle of the Report's recommendations, since they proposed using the price mechanism in order to determine water consumption, while

[63] Evidence given to the Committee by Avraham Beiga Shohat, on July 24, 2001

[64] Shaul Arlozoroff chairman, *Report of the Committee for examining the Administration of the Supply of Water in Israel*, Tel-Aviv, April 1977 (Hebrew)

hurting the farmers.[65] Minister of Finance Aridor adopted the Report's recommendations and presented them as a draft resolution for the approval of the Government towards the 1997 budget, but the Government avoided taking a decision. A year later Minister of Finance Ya'acov Ne`eman once against presented this draft to the Government, but as a result of Sharon's and Eitan's objection, it was decided to go on discussing the recommendations, and in this way the Report was in fact buried.[66]

7.3.6. The Process of Determining Policy and Decision Making

All the issues discussed above - the multitude of bodies dealing with the subject, the disregard for plans and recommendations, and the non-implementation of decisions - are only part of the reasons for the failures in the process of laying down policy and policy making in the Israeli water sector. Even when positive decisions, from the point of view of the water sector, are taken, such as, for example, the decision of the Ministerial Committee for Social and Economic Affairs, of March 20, 2002, concerning the desalination of seawater (see paragraph 9.6.1.), or the importation of water from Turkey (see paragraph 9.6.4.), the process leading up to the decision, and the of the randomness of the decision, are faulty.

Since when has the problem existed? Old-timers in the field remember days in which the Prime Ministers themselves (especially David Ben-Gurion and Levi Eshkol) or senior Ministers played a central role in the decision making process, when decisions were taken in an orderly manner.[67] But some saw things differently. Thus, for example, in his book *Water of Fights and Deeds*, Simcha Ballas described the process in the early 1950s, while complaining of the multiplicity of authorities dealing with the issue, and expresses complaints against everyone, but especially against the Ministry of Finance:

> "From the Ministry of Finance I did not only receive money, but advice as well. A little money and a lot of advice... The people at the Ministry of Finance are not only experts on lakes and swamps, they are also experts on mechanical problems - they know what is preferable, diesel or electric engines..." [68]

[65] Evidence given to the Committee by Meir Ben-Meir, on July 9, 2001

[66] Evidence given to the Committee by Deputy head of the Budgets Department in the Ministry of Finance, Ronen Wolfman, on August 1, 2001

[67] A fascinating example appears in Prof. Michael Brecher's book, *Decisions in Israel's Foreign Policy*, London, Oxford University Press, 1974, pp. 172-224, which deals with the decision making in connection with the American Johnston plan, for the distribution of the Jordan River waters, and the decision to construct the National Carrier in the 1950s

[68] Simcha Ballas, *Water of Fights and Deeds*, Ramat-Gan, Masada Publishers Ltd. 1973, pp. 174-5 (Hebrew)

The Committee looked into studies in the sphere of decision making in Israel in general, and in the Israeli water sector in particular, and reached several insights. For example, in Prof. Yehezkel Dror's book *A Memorandum for the Prime Minister - to Build a State* - the following explanation was found:

> "In Israel there has developed (I almost wrote 'grew wild') a bad system of administration, that produces a weak output, even though as individuals, many of the politicians and civil servants are talented, devoted people, with initiative and experience, and to a growing extent an academic education. There are also more than a few units in the Israeli administration that in themselves operate reasonably, and sometimes even well. However, the fairly good people and the reasonable units combine in a manner that produces a generally bad product. In other words, a system developed that spoils the outputs of its components, instead of improving them, and adding them up into a good overall output. Terms like 'wars of the Jews' demonstrate ways of action in which a much of the energy and capacity is wasted on contests within the administration, and mutual attrition, instead of uniting for a successful contest with joint national challenges. However, the 'wars of the Jews' are only a small part, that stands out from amongst many processes, in which elements that are reasonable and even good in themselves join in the Israeli administration into overall weak and even negative outputs".[69]

David Deri and Ilan Solomon brought a different explanation in their study *'Après moi le Déluge' - Uncertainty and Water Policy in Israel*:

> "The title *'Après moi le déluge'* accurately presents the manner in which the water sector is run in a period characterized by a high level of uncertainty. The decision makers measured their steps on the basis of a short term perspective, and did not pay attention to a variety of warnings coming from different professionals, including some that were invited by them from abroad.
> In situations that are characterized by a high level of uncertainty, it is reasonable that expert advice covers a wide gamut of predictions. If the decision maker does not want to accept opinions that are inconvenient to him, he will not have any difficulty in finding different opinions, that even if they do not support his opinion, their mere existence frees him from the need to accept inconvenient opinions".[70]

Among the witnesses that the Committee heard, there were those who argued that the decision making process in Israel is similar to that in the Third World. Prof. Dan Zaslavsky expressed this position in a most direct manner:

> "The difference between Third World countries and advanced countries is in their ability to plan towards a crisis - in their ability to react to a crisis. Gentlemen, we are reacting today in every way like an African state from the Third World, and we have been doing this for a very long time".[71]

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[69] *A Memorandum for the Prime Minister, B' - to Build a State*, Jerusalem, op. cit. p. 50

[70] David Deri and Ilan Solomon, *'Après moi le déluge' - Uncertainty and Water Policy in Israel*, Jerusalem, the Jerusalem Institute for Israel Studies, 1995, p. 39

[71] Evidence given by Prof. Dan Zaslavsky to the Committee, on July 15, 2001

Prof. Avishai Braverman said it in a slightly more delicate manner. The problem, he argued, is that on the one hand the State has stopped operating like a socialist state, that can implement projects by issuing bonds, but it is not yet an enlightened capitalist state, that is able to use private initiative effectively "Out system of performance today is not in the direction of Europe. We are approaching a performance of the Third World".[72]

Prof. Arie Issar offered an explanation in a different direction - a conceptual stalemate:

> "There is the matter of the concept, or what is known in science as paradigm. This means that there is a group that adopted a concept, and any questioning of this concept shakes the world view of those that are members of it". [73]

The result is, according to Issar, that they refuse to accept any new concept, even if it is extremely logical.

In her study "Israel's Water Policy: Political Paradigms, Policy Networks, and Public Policy", Gila Menahem gave a more detailed explanation to this approach:

> "A sectorial, corporistic policy network, managed to systematically block any attempt to remove the priority position granted agriculture, even in face of accumulating evidence that there is a need for a change of policy. The policy network objected to include important new foci of interests, such as environmental or geopolitical interests. The findings of the current study show that one must distinguish between the political and economic power of the members of the network, and the network's ability to preserve the policy paradigm. In the current situation, the water policy network managed to preserve the supremacy of the agricultural interests, despite the erosion in the political and economic power of the agricultural sector. The preservation of the policy paradigm, even after central members in the network lose their political power outside the network, strengthens the argument that emphasizes the roles of policy networks as decisive institutions in deciding policy". [74]

Most of the witnesses that appeared to the Committee and touched the issue, preferred to blame the Ministries or specific bodies. So, for example, the Director of the Water Sector Administration in the Ministry of the Interior, pointed an accusing finger at the Ministry of Finance:

> "Our problem in the State of Israel, is in the system of government... On the one hand the Water Commissioner - he has the responsibility to ensure that there will be water, that everything will be as it should be. But when he wants to take the simplest and smallest measure - the authority is in the hands of the Ministry of Finance. In the Ministry of Finance there is a group of people, who in my opinion are very talented, but

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[72] Evidence given by Prof. Avishai Braverman to the Committee, on July 30, 2001

[73] Evidence given to the Committee by Prof. Arie Issar, on July 30, 2001

[74] Gila Menahem "Israel's Water Policy: Political Paradigms, Policy Networks, and Public Policy", in David Nahmias and Gila Menahem eds. *The Public Policy in Israel*, Jerusalem, the Israeli Democracy Institute, 1999, p. 59

> their problem is that every year and a half of two years they change, and by the time they have learnt the material, they are somewhere else".[75]

The Ministry of Finance responsded. In his evidence Ronnen Wolfman explained:

> "Concerning the water sector policy in general... there were two basic alternatives: one was to run it on the basis of economic allocations... and the second on the basis of administrative allocations... The distortions are caused by the method of quotas, whose allocation I believe creates a real problem... The agriculture wants a much larger quota - the market does not want, and cannot afford this quantity, and reduces it on the basis of indexes. Then, around this there are distortions in allocation, there is trading - some of which is legal and some of it illegal - within this process, and all sorts of other side effects... The administrative allocation also causes problems in terms of the price of water... In my opinion, part of the problem results from the fact that the price of sweet water is low..." [76]

Prof. Yo`av Kislev considers the Water Commissioners to be the problem:

> "The root of the problem in the water sector, in terms of the crises that we come across, is in the fact... that we relied on the professional consideration of the Water Commissioner, and this turned out to be something of an illusion".[77]

Dr. Amos Bein offered an explanation in a different direction:

> "Since the privatization of "Tahal", the organic official factor that serves, in fact, as a basis for the decisions of the Water Commissioner is first and foremost the Hydrological Service. I consider this to be one of the roots of the problem in which we find ourselves: the total subjugation of the professional factor to the decision maker... First of all, one must bring in an independent professional factor, that presents a reliable picture of the reality and forecasts, without being dependent on the decision maker... Secondly, and in my opinion not less important, something that is connected to the first point, which is the need to create a legal framework and apparatus that is not subject to the decision maker, and it will determine the permitted deficit in the management of the water sector at any given moment".[78]

Dr. Eran Feitelson proposed that the problem be sought especially in the absence of a system of checks and balances - a system that enables all the various approaches to express themselves, where at the end of a correct political process, a decision is taken. [79] In other words, what is lacking is a system that will take all the positions described above into account, and decide among them, instead of letting them neutralize each other.

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[75] Evidence given to the Committee by the Director of the Water Sector Management in the Ministry of the Interior, Moshe Avnon, on July 31, 2001

[76] Evidence given to the Committee by Ronen Wolfman, on August 1, 2001

[77] Evidence given to the Committee by Prof. Yo`av Kislev, on August 13 , 2001

[78] Evidence given to the Committee by the Director of the Geological Institute, Dr. Amos Bein, on December 23 , 2001

[79] Interview with Dr. Eran Feitelson (from the Department of Geography at the Hebrew Univeristy) held by the representative of the Committee on February 26, 2002

7.4. Agriculture and Water

The discussion on agriculture in connection with the background to the crisis in the water sector, stems from several reasons:

1. Agriculture was and remains the main water consumer in Israel, even though the percentage of sweet water consumed by agriculture in relations to other sectors in the economy, is constantly declining. While in 1970 agriculture used over 80% of the sweet water ,[80] in 2000 it used less than 50%;[81]
2. From the establishment of the State in 1948 and until ,1996 the Israeli water sector was run by the Ministry of Agriculture, and all the Water Commissioners except for Prof. Dan Zaslavsky, who served in the years 1991-92, and Shimon Tal, who has been serving since the middle of 2000, were representatives of the agricultural sector;
3. From October 1975 and until July 1992, the prices of water for agriculture were set by a sub-committee of the Knesset Finance Committee, in which the dominant members were members of the agricultural lobby in the Knesset;
4. Most of the public representatives in the Water Council are representatives of the farmers.

The central argument of those who view agriculture as chiefly responsible for the crisis, is that since the quantity of water in the economy is limited, since the quantity of water for home consumption is continuously growing (both because of rapid population growth, and because of rising standards of living), and since industry has reached an extremely high level of efficiency in the use of water - the only sector in which it is possible to cut water allocations in times of crisis is the agricultural sector.[82] Even though over the years, the use of water in agriculture has become impressively efficient, and in certain years the quotas of water for agriculture were cut significantly, according to those complaining, more water was allocated to agriculture than could be afforded, and there was need to over-pump in order to supply the quotas.

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[80] Yaacobi Committee Report for Examining the Secondary Legislation Regarding Water Prices in the Country. The Ministry of Agriculture, Tel-Aviv, August 1971

[81] Water Commission data. In 2002 it is expected that agriculture will consume 41.4% of the sweet water, and in 2010 33.7% (see table No. 4 above)

[82] In 1976, the Minister of Agriculture lay down regulations that stated, that in rationing zones (which are those areas in which there is a water shortage - in other words, most of the State), the first priority is to allocate water for home uses and services, the second priority is industry, and agriculture comes in third place only

Why, ask those complaining, were the water quotas for agriculture not cut, or were insufficiently cut? And they themselves answer: because, throughout the years, policy making concerning water and its allocation, was in the hands of the farmers' representatives, and even when the Ministry for National Infrastructures was established in 1996, it was headed by a distinguished representative of the agricultural sector - Ariel Sharon.
And how, in their opinion, should one have acted? Already in the course of the 1970s, there started to develop an economic school of thought that argued, that the problem is that the price of water for agriculture is too low, both because it is sold to consumers at much below cost, and because no account is taken of the laws of supply and demand for a product that is in short supply.[83] If you will raise the price of water to its real price, those who support the economic school of thought - mostly economists and officials in the Ministry of Finance - argued (and continue to argue), the demand for water in agriculture will decline to a realistic level, the water deficit will fall, the over-pumping will stop, and it will not be necessary to start producing expensive water by means of desalination. This position was adopted by the State Comptroller, in her special report on the water sector in 1990. (See above paragraph 7.3.4.)

Prof. Yo`av Kislev, who objected to, what he considered to be the inclination to start desalination prematurely, explained this position to the Committee in the following words :

> "In my opinion, prices, including production levies ,are the most efficient tool for allocating water in all the sectors. The prices should be fixed on the basis of the marginal cost of production. There is no justification to desalinate water, or bring water from Turkey, in order to use them to grow the type of crops that we are growing today".[84]

Appearing to the Committee Prof. Dan Zaslavsky gave a cynical response to this approach:

> "The approach of the Ministry of Finance says that we should raise the price, the farmers will be unable to pay it, they will stop utilizing the water, and then there will be no problem. In this manner one may solve the problems in education, in this way one may solve the problem in the health system - let us put the price up, and thus end the story". [85]

Among the most extreme spokesmen in favor of the economic school of thought, there were some in the past that did not object to the complete disappearance of agriculture in Israel,

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[83] See for example, David Bo'az, "Prices as distorters of the allocation of water in the economy", *The Economics Quarterly*, Vol. 23, No. 91, December 1976 (Hebrew)

[84] Evidence given by Prof. Yo`av Kislev to the Committee on August 13 , 2001

[85] Evidence given to the Committee by Prof. Dan Zaslavsky, on July 15 , 2001

should it become evident that agriculture cannot live up to economic criteria, including realistic water prices. It seems as though it is not politically correct today, to say things like this, and the Committee did not hear a single witness who openly supported this position. Nevertheless, according to one of the witnesses, one of the Director Generals of the Ministry of Finance in the first half of the 1990s said, in reply to the argument that agriculture in the United States and in Europe is subsidized, that from an agricultural point of view, Israel should be like Singapore - in other words, a country in which there is no agriculture.[86]

The farmers' spokesmen responded in kind. One should not, they say, treat agriculture only as an economic sector, like any other economic sector. One should take its Zionist value into consideration, since one of the foundations of the Zionist ideal was the return of the Jews to the soil, and farming. One should not forget that a large public was sent by the State "to make the desert bloom". An additional problem is that if Jews will not work the land, because it is not profitable, others, whose standard of living is lower, will. One should also take the security value of agriculture into account, as an economic branch that offer employment to the population that lives in the periphery and along the borders, and for many of whom agriculture is almost the only source of income. In addition, one should take the need for Israel to be independent in terms of supplying its own food, into consideration. And last but not least, one should take the importance of agriculture to the environment into account, as an important component in the State's "green lungs".[87]

The spokesmen of the farmers, who appeared before the Committee, argued, that if there is today a water shortage, it is the result of the fact that the Ministry of Finance objected in principle, until three years ago, to desalinate seawater before the year 2010, so that there is a

[86] Evidence given to the Committee by former Minister of Agriculture Ya'acov Tsur, on August 12 , 2001. Similar evidence was given to the representative of the Committee by Prof. Israel Dostrovsky from the Weizmann Institute, in an interview that took place on January 31, 2002

[87] In an interview with the representative of the Committee, held on February 3, 2002, Prof. Hillel Shuval disclaimed all these arguments. Zionism today, he said, means absorbing immigrants, and become a State with a population of 10-12 million people - not being a State with an unprofitable agriculture. As to security, before and immediately after the establishment of the State, there was great importance to civilian settlement along the borders, at any price. Today we are living in a different era, and the order of priorities is different. As to independence in the supply of food - this is an illusion. Already today 80% of the calories that are consumed in Israel are imported - the importation of food for human beings, and for animals. As to the green lungs "preserving the lands as green lungs is critical for the State. However, I am sorry to say that this will not come from agriculture... We must prevent the agricultural areas that are no longer used for agriculture from turning into real-estate, by means of a declared policy of preserving green areas as national parks, gardens and nature reserves" and this at a quarter of the quantity of water required today in order to preserve and unprofitable agriculture.

delay of several years in starting the desalination.[88] The farmers also point out, that a growing percentage of the water which they use is effluents - there is a disagreement as to the exact quantity, but it is over 250 million Cu.M per annum - and brackish water. They add, that the argument that the water supplied to agriculture is subsidized is incorrect, and that the real subsidization is in several peripheral areas, that are not necessarily agricultural.[89] And an additional argument: the farmers do not really need high quality water, or at a high level of supply credibility, like that supplied for home use, so that in any case it is unjustified and unfair that the farmers should pay the same price as households.[90]

However, the most comprehensive description of the continuous historical paradox of agriculture and the crisis in the water sector, was given by Meir Ben-Meir ,at a deliberation held by the Knesset State Control Committee in January 2000, towards the end of his term as Water Commissioner:

> "Most, if not all, of the agricultural settlement since the establishment of the State, was the result of state planning. The settlement regions and location of settlements, their size and the scope of agriculture in them, including the farming branches, and since the legislation of the Water Law, also the water quota, were all the result of comprehensive planning. The important point to emphasize in terms of the water sector was the formulation of a planning approach, that laid down the need for balance between the scope of the development of the agricultural settlement, and the supply of water, where its limited potential, both within the green line borders, and between the Jordan River and the Sea, was determined several times... The result of this approach gave birth to an agricultural plan half of which - around two million dunams (1 dunam ~ 0.25 acres) - was irrigated farming, and the rest unirrigated farming... For many years around 1.2 billion Cu.M of water per annum, were earmarked and allocated to the agricultural sector, that irrigated, more or less, around two million dunam. A marked contradiction between the planning and the climatic reality took place, and continued to take place with ever growing strength, with the increase in urban demand, in years of drought. In these years of little rain, the average quantity of 600 Cu.M per dunam does not satisfy the needs of the plants on the one hand, but exactly in these years a cut in the allocations for agricultural, which is defined as a flexible consumer, was implemented, on the other. It should be noted... that structural changes that have taken place in agriculture, having to do primarily with the introduction of capital intensive green houses, have increased, and with them a growing dependence on a rigid allocation of water. In other words, the absence of flexibility, that enables the adaptation of agriculture to climatic crises...
> From the end of the 1980s an approach, or perhaps an ideology, has taken root, that claims that planning on the one hand, and a Western democratic regime, and a modern economy, on the other, do not go together... Yet, simultaneously with the removal of the planning limitations on agricultural development and its scope, the financial

[88] What the farmers sometimes forget is that in the past they too objected to desalination, because they feared that desalination would raise the price of water for agriculture as well.

[89] Statement by Yoram Tamari to the Committee on September 10, 2001. Tamari repeats this argument before every possible forum

[90] Comments made to the Committee by Yoram Tamari, on November 25, 2001

> encouragement continued. The water sources have long ago been exhausted to the very end... The green houses (that were supposed to save water), were extended to such dimensions that the original water quota that was planned by the state factors as the allocation for water intensive farming, which is less capital intensive, was no longer sufficient for farming that is clever and capital investment intensive, even though it saves water per unit of production. To add to the contradiction, simultaneously with the loosening of the strictures of planning, there began an initiated expansion of the agricultural sector by the state system, such as orange groves, in the Shalom district and Katif region (in the South), and deciduous fruit trees in the settlements of the High Mountain (in the North)...
>
> A significant segment of the agricultural settlement has taken place in regions where there are few alternative sources of employment. The scope of the farming that developed in the absence of binding planning, but with the support of the Governments, is the cause for the increase in the more rigid - not more flexible - demand for water. The Governments added to this the tendency for economic competition for water allocations to agriculture - a trend that is accelerated by means of a scaled method of pricing, that once again is meant primarily to reduce the agricultural consumption - a method that is being rejected persistently and continuously by the Ministers of Agriculture... Within this maze one wishes or expects the squaring of the circle - to allocate water to a modern agricultural sector, that is capital investment intensive, that was development beyond the feasible supply of water, to comply with the urban demand that is growing by about five percent per annum, to fulfill political obligations (to Jordan and the Palestinians), and at the same time to preserve the water sources from depletion and contamination. In other words, to prevent a deficit in a system, in the actual structure of which a deficit is in-built.
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> A deficit cannot be closed by means of a miracle or some clever administrative act. A deficit can be closed by one of two means: either by decreasing consumption or by increasing sources. The term administrative is not synonymous with creating something from nothing... If the Government believes that one must reduce the scope of agriculture, and solve the problem in this way, or by closing the growing gap between supply and demand, if if believes that one should reduce the scope of agricultural and its geographic spread and balance it with supply of water from unstable or sensitive sources, let it decide so, and give specific instructions accordingly".[91]

The last point was presented by Prof. Uri Shamir in a slightly different manner, when he appeared to the Committee:

> "The Government is the one that must decide on the scope of agriculture, its location, nature and the quantities of water available to it, and then the Water Commissioner must manage accordingly".[92]

Recently the Ministry of Finance has modified its rhetoric on the issue of agriculture [93],and towards the end of March a document, entitled "A new agricultural policy - a reform in the

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[91] Evidence given to the State Control Committee by Meir Ben-Meir, on January 3, 2000

[92] Evidence given to the Committee by Prof. Uri Shamir, from the Technion, on November 25 , 2001

[93]Thus, for example, the new Director General of the Ministry of Finance, Ohad Mar'ani, said to the Committee while appearing before it on August 8, 2001: "We shall provide for agriculture: by achieving the preservation of lands, a livelihood for peripheral settlements, green lungs and all those things that we absolutely support. These things must be attained and ought to be attained not by means of water subsidization".

prices of water", was signed by representatives of the Ministry of Agriculture and the Budgets Department of the Ministry of Finance.[94] The document, that was approved by the Government,[95] that was the result of extensive deliberations between the two Ministries, changes the approach on the subject of water prices for agriculture, and Government assistance for the working of the land (for further details see article 9.5.), but the paradox has not yet been resolved. And so, while the Water Commissioner is making desperate efforts to balance the supply and demand for water until the first desalination plants go into production, the Government objected to his demand to decrease by 73% the quotas of sweet water for agriculture for 2002,[96] and even by 55%, [97] which is the only way, in his opinion, to prevent destructive over-pumping. According to Meir Ben-Meir, a cut in the water quotas, as demanded by the Water Commissioner, will lead to the destruction of agriculture and the loss of lands, and until the desalination plants go into production, one should continue the over-pumping from the Coastal Aquifer.[98] (See paragraph 9.7.1.)

Following are a few figures that ought to be taken into account: since the 1970s the profitability of many agricultural branches in Israel has been declining, due to the trend of rising costs, including water prices, and a decline in the prices in the world of agricultural products from plants on the one hand, and of high exchange rates for the Shekel opposite the European currencies, on the other hand.[99] For this reasons, and additional reasons, a falling percentage of employment, Net Domestic Product, and exports is connected with agriculture. Today only 2% of the working force is in agriculture[100] (compared with 15.7% in 1958) [101]; Agricultural product constitutes 2.3-2.4% of the NDP[102] (compared with 13.5% in 1958)[103];

[94] The Ministry of Agriculture and the Ministry of Finance, document signed on March 27, 2002

[95] Government resolution No. 1740 of April 28, 2002

[96] Government resolution No. 1392 of February 3, 2002

[97] Government resolution of March 20, 2002

[98] Lecture by Meir Ben-Meir at the symposium of the water association, that took place at Kibbutz Afikim on April 10, 2002

[99] Evidence given to the Committee by former Minister of Finance Avraham Beiga Shohat, on July 24, 2001 and the lecture of Prof. Yo`av Kislev before the symposium of the water association, that took place at Kibbutz Afikim on April 10, 2002. (It should be noted that since Shohat and Kislev spoke, the Shekel has undergone a steep depreciation, and the main problem regarding the sale of Israeli agricultural products in Europe is now political)

[100] Figure of the Director of the Agricultural Planning Authority in the Ministry of Agriculture, as publisehd on February 18, 2002

[101] The Central Bureau of Statistics, *Statistical Abstract - 1962*, No. 13, Jerusalem, 1963, p. 394

[102] The Central Bureau of Statistics, *Statistical Abstract - 2001*, No. 52, Jerusalem, 2001, article 14.7

Agricultural exports (food and animals) in 2000 was valued 778.8 million dollars and agricultural imports (mostly food for animals, primary food stuffs and wheat) was valued 1,534.2 million dollars; Agricultural exports constitute 2.5% of the total exports[104] (in 1965 food exports constituted 29% of total exports).[105] According to a comparative study prepared by a British professor, in the mid 1990s, one cubic meter of water in Israel produce on average 1.49 dollars of agricultural produce, 120 dollars of industrial produce, and 687 dollars in the services.[106]

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[103] The Central Bureau of Statistics, *Statistical Abstract - 1966*, No. 17, Jerusalem, 1967, p. 176

[104] *Statistical Abstract - 2001*, article 16.4

[105] *Statistical Abstract - 1966, p. 237*

[106] Peter Beaumont, "The Quest for Water Efficiency - Restructuring of Water Use in the Middle East" in Shimshon Belkin and Shoshana Gabbay eds. *Environmental Challenges*, the Netherlands, Kluwer Academic Publishers, 2000, p.555

8. A Master Plan for the Water Sector

For the water sector the term "master plan" has the same meaning as "constitution" has for the advocates of democracy - a sort of vital basis, in the absence of which the water sector or democracy are liable to go astray.

Since several years before the establishment of the State, the managers of the water sector prepared several master plans. One of the old-timers in the water sector, Shmuel Kantor, relates, that when he participated in the preparation of the first master-plan for the Jewish Community before the establishment of the State, there was a major debate whether and when to establish the national water project from the Sea of Galilee southwards - whether to push it forward as a basis for all other activities, or on the contrary, to put it off for as long as possible.[107] A similar argument has been going on in the last three decades on the subject of seawater desalination, only it would appear that on the subject of the national carrier a master plan was adopted and followed, and these days a decision regarding seawater desalination was adopted without a master plan, and without the decision makers having a complete picture regarding all the ramifications of their decision.

We have already reviewed the fate of the master plans of 1988 and 1997 (see paragraph 7.3.5.). Towards the end of April 2002 the Water Commission presented a new master plan (transition), covering the years until 2010.[108] This plan will soon be presented to the Government , with the purpose of receiving its approval, while a follow-up plan is in stages of preparation.[109]

Before he resigned it was the Minister for National Infrastructures, Avigdor Lieberman, who pushed for the preparation of the plan. The plan's ten main goals are:

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[107] Comments made by Shmuel Kantor at a symposium organized by the Water Commission on the subject of the Master Plan for developing the water sector, that took place at the agricultural center at Beit Dagan on January 30, 2002

[108] Various details from the new master plan are mentioned all along the Report

[109] Comments made by Shimon Tal at a symposium organized by the Water Commission on the subject of the master plan for developing the water sector on January 30, 2002. Regarding a long-term master plan Tal said: "Parallel with this plan (the transition plan), the Planning Division is preparing, with the assistance of Giora Shaham, a long-term program for the water sector, that will also deal in a much greater detail with the long-term national goals, concerning the water sector. The timetable for implementing this program, which is, in fact, a more comprehensive master plan, has not yet been defined, but I presume that it will be approximately one year from today".

1. Stabilizing the water system and balancing it by 2010, even if the climatic conditions will be similar to those of the last decade. A balanced system is one that will ensure a reliable supply of water to the various consumers in the long run, on a sustainable basis;

2. Stopping the deterioration of the natural resources, by bringing them back by 2005 to levels above the hydrological red lines;

3. Ensuring the quality of water in the natural reservoirs on the basis of a sustainable preservation, including "reversing" the balance of salts, improving polluted wells, and carrying out observation activities;

4. Preparing a work plan to bridge between the state of serious shortage prevailing in 2002, and the year 2010, so that the gaps between demand and supply are reduced;

5. Developing and exploiting the maximal amount of various types of marginal water, while adapting them to the various uses;

6. Adapting the quality of the water supplied for various uses to common Western standards;

7. Connecting independent water systems to the national system, as required;

8. Rehabilitation of the country's rivers, and turning them into qualitative nature foci, and ensuring the preservation of nature and landscape values;

9. Gradually starting to manage the water sector on the basis of supply and demand, with central supervision, within the law for a reform in the water sector;

10. Reorganizing the Water Commission and its supplementary systems, and supplying them with resources, so that the attainment of the goals shall be possible.[110]

When he first presented the plan in January, the head of the Planning Division of the Water Commission, Dr. Yossi Dreizin, noted that the two main goals of the plan are to rehabilitate the water sector "to the not good situation, in which it was until the end of the last decade" and reach a situation of stability by 2010. Even though the plan presents the minimum that must be done, Dreizin admits that today the water sector is not ready to implement it - especially not the Water Commission and "Mekorot" (Prof. Uri Shamir added, in an interjection, that the private sector is not ready either). In order to implement the plan, it will be necessary to strengthen the capability of the professional management, strengthen the implementation capability, and strengthen the status of the Water Commissioner "so that he will be able to regulate this system".[111]

[110] The Ministry for National Infrastructures, and the Planning Division of the Water Commission, *Master plan (transition) for the development of the water sector in the years 2002-2010*, final report, April 2002, pp. 2-3

[111] Comments made by Dr. Yossi Dreizin at the symposium organized by the Water Commission on the subject of the master plan for developing the water sector on January 30, 2002

The Master plan estimates that in 2010 the overall demand for water, of all qualities and for all requirements (including obligations to the Jordanians and the Palestinians), will be around 2,288 million Cu.M (compared with 1,930 million Cu.M in 2002). In order to supply this demand, without continuing the over-pumping, it will be necessary to desalinate and import around 500 million Cu.M, develop sewage reclamation plants so that the supply of effluents for agriculture and other purposes will reach around 510 million Cu.M, desalinate up to 100 million Cu.M of brackish water and improve wells. In order to attain these goals, it will be necessary to invest a sum of 17,105 million Shekel by 2010, of which 9.672 million will be invested by "Mekorot" and 7,433 million by the private sector.[112]

Table No. 10: Investments in the development of the water sector, by types of project and identity of executer, 2002-2010, according to the Master plan of the Water Commission

Type of project	**Total investment in millions of Shekels**		
	Private	**"Mekorot"**	**Total**
Seawater desalination and imports	4,046	884	4,930
Desalination of brackish water	708	177	885
Improvement of wells	272	384	656
Sewage reclamation plants	1,381	1,224	2,605
Upgrading of effluents	250	250	500
Water supply projects	-	2,560	2,560
Judea and Samaria	-	300	300
Innovations and improvements	-	2,250	2,250
Observation and research	100	100	200
+ 10% for the unexpected	675	879	1,555
Total investment	7,433	9,672	17,105

Based on table No. 24, the Ministry for National Infrastructures and the Planning Division in the Water Commission, *Master plan (transition) for the Development of the Water Sector in the Years 2002-2010*, Final Report, April 2002, p. 74

As expected, most of the criticism of the plan came from the representatives of the Ministry of Finance, who argued that what is missing in the plan is an analysis of economic viability regarding the vast investment plan, and that it does not contain any serious treatment of demand,[113] and the representatives of the Ministry of Agriculture, who demanded that the requirements of agriculture be treated as those of a consumer with equal rights to those of other sectors, and not as an overlapping excess.

[112] Figures brought in *Master plan (transition) for the development of the water sector in the years 2002-2010*

[113] Comments by Gil'ad Riklis and Erez Yamini of the Budgets Department of the Ministry of Finance at the symposium organized be the Water Commission on the Master plan for the Development of the Water Sector, that took place on January 30, 2002

9. An analysis of Specific Problems and Recommendations

9.1. Immediate Measures That the Government Must Adopt

Parallel with the long-term and continuous actions that the Government must take, it must contend rapidly and efficiently with the immediate crisis in the water sector.

9.1.1. Emergency Regulations

The Committee contended with the question whether, in light of the emergency situation in the water sector, it ought to recommend the introduction of emergency regulations. When the Committee started preparing an interim report (which was finally not published), the legal advisor to the Committee presented a legal opinion objecting to such a recommendation, because on the basis of several rulings of the High Court of Justice, it is doubtful whether the current situation warrants the use of emergency regulations, and because the negative position of the Attorney General's Office regarding the use of the Regulations in such cases, is known. Nevertheless, use was made in the past of emergency regulations in the water sector - the last time in 1999, in order to cut sweet water allocations, to levels of between 30% and 80% of the water quotas of 1989.[114]

The Committee finally reached the conclusion that the situation in the water sector fulfills the conditions that appears in article 50(a) of Basic Law: the Government, regarding the introduction of emergency regulations, which states: "In a state of emergency, the Government is entitled to introduce emergency regulations in order to defend... the existence of vital supplies and services..." , and decided to recommend the introduction of regulations, at the center of which would be:

(a) Authorizing the Water Commissioner to diminish production, supply or consumption of water of various sources, or from a specific defined source, should the hydrological or climatic conditions make this necessary;

(b) Authorizing the Water Commissioner to issue new production licenses, adapted to the emergency, that will enable him to implement changes in the production licenses, by means of quick procedures, on the basis of his professional discretion;

(c) Authorizing the Water Commissioner to initiate and publish tenders for the establishment of enterprises for the development of new water sources, and to advance

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[114] The State Comptroller, *Annual Report No.51b*, Jerusalem, April 29, 2001, p. 764 (Hebrew)

projects in the water sector, by means of quick procedures within an approved budgetary framework, while preserving the professional and administrative authority in his own hands;

(d) Establishing special planning committees to approve enterprises and projects in the water sector by means of a short and quick procedure, as long as the regulations are in force;

(e) Authorizing the Water Commissioner to connect private wells to the national water sector, and to activate wells that went out of use in the past, with the goal of supplying potable water and water for home consumption;

(f) Authorizing the Water Commissioner to instruct the local authorities and the water associations to manage the water sectors efficiently and frugally, including the installation or changing of accessories or installations to ensure the efficient use of water;

(g) Authorizing the Water Commission to stop production, supply or consumption of water immediately, in any case of a danger of contamination;

(h) Authorizing the Water Commissioner to enforce comprehensive inspection, to enter any location and to perform any act necessary to protect a source of water, in order to preserve it and ensure the uphold the conditions in the license. The Commissioner will be authorized to impose financial sanctions, and hold criminal proceedings, to close a water source and suspend a production license, to the extent required;

(i) Concentrating the legislative powers on water matters, in the hands of the Prime Minister;

(j) Authorizing the Prime Minister, in consultation with the Minister of Finance, the Minister for National Infrastructures, and the Minister of Agriculture and Rural Development, to fix the various water prices and production levies during the emergency period, according to the needs.

9.1.2. The Establishment of a Ministerial Committee For Natural Resources, Agriculture and the Environment

The Committee calls upon the Government to establish immediately a Ministerial Committee for Natural Resources, Agriculture and the Environment, headed by the Prime Minister, that will be able to take coordinated decisions in all these spheres. The meetings of the Committee can also be run, depending on the matter being deliberated, by the Minister for National Infrastructures, the Minister of Agriculture or the Minister for the Environment. It is important that in every meeting of this Committee the Minister of Finance, or his

representative shall be present. The most urgent issues that will be placed on the agenda of the Committee in the sphere of water will be:

(a) To approve the Master Plan for the development of the water sector until 2010, that was presented by the Water Commission in April 2002; (See chapter 8)

(b) To encourage the Water Commission to prepare a master plan for the long run, up to the year 2040;

(c) To initiate and prepare a new water law; (See article 9.3., and chapter 4 in the recommendations)

(d) To strengthen the Water Commission and the Water Commissioner; (See paragraph 9.2.1.)

(e) To follow up the implementation of the reform regarding water prices for agriculture, and support for preserving agricultural areas, that was approved by the Government on April 28, 2002; (See article 9.5.)

(f) To deliberate a much broader reform in agriculture, that in addition to the issues included in the current reform will deal, *inter alia*, with the national spread of agriculture; the types of crops that will enjoy encouragement, while limiting as far as possible water guzzling crops; fixing the quantities of sweet, brackish and reclaimed water that will be supplied to agriculture until the stabilization of the water sector, and turning part of the agricultural lands into national parks or natural reserves, in order to prevent turning them into real-estate; the establishment of a professional committee for the pricing of water and fixing the production levies; (See article 9.5.)

(g) To receive current reports regarding the pumping from the water reservoirs throughout the interim period; (See article 9.7.)

(h) To receive reports on the allocation of water to the various sectors. (See paragraph 9.4.1.)

9.2. Treatment of Institutional and Organizational Problems

The discussion of the reasons for the crisis in the water sector, points to marked organizational failures, that are responsible for the fact that despite the warnings, and the grave findings of reports and plans over several decades, hardly anything has been done to contend in a serious and deep manner with the problem, and the crisis resulting from it. Therefore, the Committee sees fit to emphasize the organizational changes that it believes should be instituted in its opinion.

9.2.1. Strengthening the Water Commission and the Water Commissioner

At least in the current emergency period, and unconnected with the long term solution, it is desirable to strengthen the status of the Water Commissioner and the Water Commission. It is necessary to add to the Commission resources and man-power, and to strengthen the professional and functional divisions within its framework.[115]

In his evidence to the Committee, Prof. Uri Shamir, who supports the establishment of a water authority in the long run, explained that since it is impossible to establish such an authority overnight, it is necessary to take advantage of the potential of the existing framework - in other words, the Water Commission.

Why can't one establish a water authority overnight?

> "I know the governmental organizational systems. If you will start a change today, you are getting yourself into World War III, with eight to nine Ministries, and you also need legislation for this purpose".

And what is the problem with the Water Commission?

> "There are excellent people there... The current Water Commissioner is a professional, he has no political agenda, he is trying to do his best... (but) the people in the Commission are stretched to the limit, and are unable to do what needs to be done. Therefore, in the immediate future, in my opinion, one should strengthen the professional divisions of the Water Commission, and increase its man-power five or ten-fold".[116]

The statement that the Water Commission is made up of high quality man-power, but that it has turned into an "impoverished body", repeated itself time and again in the words of the witnesses.[117]

Regarding the ability of the Water Commission to act, an interesting paradox emerged. On the one hand, many mentioned the fact that according to the Water Law a large number of powers are concentrated in his hands, but on the other hand, he is extremely limited in his

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[115] The Committee received from the Water Commission details regarding its various divisions and current man-power base, and was impressed that in addition to the fact that the man-power base is too narrow, part of the senior positions are not manned. The resignation of the head of the Hydrological Service, Dr. Shmuel Kessler, against the background of professional differences of opinion with the Government, was especially worrying.

[116] Evidence given to the Committee by Prof. Uri Shamir, on November 25, 2001

[117] See, for example, the Evidence given by former Deputy Director Genral of "Tahal", Yona Kahane, to the Committee on December 23, 2001

ability to act, and it is very easy to "bend his arm".[118] Many decades ago Simcha Blass, who was the Government's advisor on water issues in the early 1950s, explained this paradox: "The Water Commissioner, who, according to the Water Law, is the central man in the sphere of water, is not in fact in that position. Because it is not the law that decides in Israel, but intrigues".[119]

Dr. Eran Feitelson has a different explanation for this paradox. The mere fact that so many powers are concentrated in the hands of the Commissioner, places him in a position where those who are in charge of him - whether the Minister for National Infrastructures or the Prime Minister - can prevent his acting on the basis of his professional consideration. If the Commissioner had fewer powers (for example, like the head of the Planning Administration in the Ministry of the Interior), but were able to act within a framework of effective checks and balances, he would find it much easier to play the political game, and ensure the adoption and implementation of desired decisions.[120]

Another interesting question that came up was whether the Commissioner ought to be a professional in the sphere of water. From the criticism heard by many witnesses regarding several past Water Commissioners, who were not professionals, it emerges that the majority does believe that the Commissioner ought to be a professional. One of the few exceptions was water engineer Gaby Shaham, an advisor to Water Commissioners and the head of a division in "Tahal" in the past, who said:

> "The way I see it, the Water Commission should not be a professional in the sphere of water. The Commissioner, who is the head of the system, dictates or adopts policy, and translates it, must be a political person. (On the other hand), the second echelon in the water body - the permanent echelon - the one that chews, examines, brings alternatives, presents the ramifications, must be made up of the best men in the profession".[121]

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[118] In comments she made during the symposium organized be the Water Commission on the Master Plan for the Development of the Water Sector, that took place on January 30, 2002, Prof. Ronit Nativ, from the Faculty of Agriculture of the Hebrew University in Rehovoth said: "Like every citizen in this country, I followed in the press as Shimon Tal's arm was bent by the Prime Minister and his men... If there is anything that I hope will emerge as a result of the current process that you have opened, it is that a situation will be created, in which it will be impossible to bend the arm of any Water Commissioner".

[119] Simcha Blass, *Water of Dispute and Deed*, Ramat Gan, Masada publishers, 1973, p. 22 (Hebrew)

[120] Interview with Dr. Eran Feitelson, held by the representative of the Committee on February 26, 2002

[121] Comment made by Gaby Shaham at a meeting held by the Committee with members of the Organization of Water Engineers on December 23, 2001

In the opinion of Dr. Eran Feitelson, the Water Commissioner ought to be a professional, but he doesn't have to be the leading expert on water in Israel, academically speaking. On the one hand, he must be capable of understanding what the experts are saying, and have the professional ability to act, and on the other hand, he must have political connections and be able to get professional decisions through the political system.[122]

The Committee recommends, that the manpower base of the Water Commission shall be broadened, the various divisions in it shall be strengthened, and its budget shall be increased. The Committee also recommends that clear criteria be laid down for the selection of the Water Commissioner, who must be a professional, but must also have political capabilities. (See also articles 3e-f in the Committee's recommendations)

9.2.2. The Establishment of an Independent Water Authority, After the Water Sector will be Stabilized

In her special report on the administration of the water sector of 1990, in which she expressed caustic criticism of the existing authorities, State Comptroller Miriam Ben-Porath wrote:

> "For the purpose of regularizing the water sector, the responsibility for its administration should be transferred to a neutral, national, professional body, that will take into account the needs of the national economy, including those of the agricultural sector, and will ensure the quality of potable water for households, and the supply of water in future in a regular and credible manner".[123]

Most of the witnesses, who appeared before the Committee, agreed that it is important, that the water sector should be run by a professional body, with implementation capabilities. However, the Committee found that opinions are divided on whether it should be an independent, national authority, that is not directly subject to the Government; whether it should be an authority more independent than the Water Commission, but still subject to some Ministry, that does not represent interests of its own in the sphere of water, or of a group of consumers or producers of water; or whether one should simply strengthen the status, and human and financial means at the disposal of the Water Commission, that will remain connected to the Ministry for National Infrastructures.

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[122] Interview with Dr. Eran Feitelson

[123] The State Comptroller, *Report on the Management of the Water Sector in Israel*, Jerusalem, 1990, p. 53 (Hebrew)

Among the witnesses who expressed support for the establishment of an independent authority was Shaul Arlozoroff, who said:

> "It is necessary to raise the issue of water to a higher status in the governmental administrative setup of the State of Israel, so that there will be an authority headed by a Governor, or whatever one might decide to call him, in which the level of sophistication, the level of flexibility and the level of budgets to do things within the system will rise, and it will be much easier for the Governor or the Authority to perform all the functions, that today slow down decision making, and implementation".

At the same time Arlozoroff warned that it would be a mistake to concentrate all the powers in the hands of a single person.

> "This doesn't exist in any Western democracy. It is impossible to disregard the Ministry of Health when we are dealing with public health, and it is impossible to disregard the Ministry for the Environment when we are dealing with matters related to the environment".[124]

As might have been expected, representatives of Government Ministries, that are liable to lose powers in the event of an independent water authority being established, expressed opposition to its establishment. Thus, for example, the Director of the Water Sector Administration in the Ministry of the Interior, said:

> "We object to the idea of a comprehensive water authority... It will not work, and it is not right, because there is no reason why the Ministry of Health should give up its powers, and there is no reason why the Ministry for the Environment should give up its powers, and the Ministry of the Interior, that deals with local authorities... Therefore, the correct solution is what the State Comptroller proposed several years ago, which was the establishment of an inter-ministerial water committee, headed by the Water Commissioner... The Water Commissioner should be obliged to convene the Committee. The Water Commissioners didn't like this Committee very much... There is a Commissioner who does not like consulting anyone, and on the other hand there is another Water Commissioner, who might be too susceptible to all sorts of ideas. One should find the middle road".[125]

It should be noted that most of those who spoke in favor of the establishment of a water authority, had no clear plan as how exactly the process ought to occur, and it looks as if the yearning for the establishment of the Authority, stems primarily from frustration regarding the existing situation. At least one speaker pointed out, that a time of emergency is not the right time to establish a new body, since this involves removing powers from existing bodies, in the midst of power struggles and legislation.[126]

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[124] Comments made by Shaul Arlozoroff at a meeting held by the Committee with members of the Organization of Water Engineers on December 23, 2001

[125] Evidence given to the Committee by Moshe Avnon, on July 31, 2001

[126] Evidence given to the Committee by Prof. Uri Shamir, on November 25, 2001

The Committee recommends that the possibility of turning the Water Commission into an independent and professional water authority, with a status similar to that of the Bank of Israel, as laid down in the Bank of Israel Law of 1954, should be examined. In other words, the authority should be incorporated, and not subject to any Ministry, and its function should be to manage, regulate and direct the water sector, on the national and regional levels, in accordance with the instructions of the Water Authority Law that will be enacted, with the policy of the Government and the recommendations of the Water Council as reconstituted. (See paragraph 9.2.4.) The Authority will be headed by a professional in the sphere of water, who does not represent any particular interest in the water sector, and who will be appointed by the Government.

9.2.3. Establishing a Ministerial Hierarchy Regarding treatment of the Water Sector

Already at the beginning of its work, the Committee reached the conclusion, that one of the significant and fundamental problems in the running of the water sector in Israel, and one of the reasons for the lack of efficiency in the decision making process and in the implementation of decisions, is the multiplicity of Ministries (of which former Minister Abba Eban once said that each operates like a fiefdom), and other bodies dealing with the issue. Not only is there a multiplicity of Ministries, but frequently their unique interests, are at odds with each other. (See paragraph 7.3.1.)

On the face of it, there are several bodies that are supposed to bring about coordination among the various Ministries and other factors dealing with the water issue: the Ministerial Committee for Social and Economic Affairs, the Emergency Staff for the Water Sector, and the Committee for the Removal of Blockages in the Water Sector. However, in fact, the coordination is faulty. The Ministerial Committee does not keep up with what needs to be done; the Emergency Staff discusses important issues, but the main message to emerge from it's meetings is frustration from the difficulty in getting resolutions through the Government; while the Committee for the Removal of Blockages, is in a state of inner contradiction, since part of the blockages in the water sector are to be found in the Office in which this Committee was set up.

Even though most of the witnesses, who dealt with the subject of the multiplicity of Ministries dealing with the water issue, agreed among themselves that one must reduce their number, [127]from the practical point of view there is no doubt that, for example, the Ministry of Health is the body that should deal with health hazards connected with water, and the Ministry for the Environment is equipped to deal with issues connected with environmental pollution,[128] the Ministry of Finance must supervise the allocation and expenditure of public funds in the sphere of water, and the Ministry for Foreign Affairs must be involved when one is dealing with agreements concerning water with foreign countries, and international organizations. However, duplicities must be avoided, and it is necessary to ensure that the coordination among the various bodies will be built into the work process.

As to the Ministry that should be responsible for the water issue as a whole - according to the law, and in practice - except for the agricultural lobby that would have been happy had the issue remained in the Ministry of Agriculture, the Committee found broad agreement, that it was a good thing that the issue was moved from the Ministry of Agriculture, to the Ministry for National Infrastructures.

Among the witnesses there were a few who thought that the Ministry for the Environment (to whose name the words "and Natural Resources" should be added) is a more suitable Ministry to take overall responsibility for the water issue,[129] and others, who due to the importance of thesubject, proposed that it should be the Prime Minister's Office that should take the issue under its wings. Former Minister for National Infrastructures, Avigdor Lieberman, suggested that the overall treatment of the water sector be divided between his Ministry, that should continue to deal with the operational side, and another Ministry - the Ministry of Health or the Ministry for the Environment - would deal with supervision, since, in his words "supervision must be in another Ministry".[130]

Of course, the effectiveness of the way any particular Ministry deals with any issue, depends on the degree to which the Minister in charge is interested in advancing it, or alternatively, the degree to which he enables the officials in his Ministry to act on a professional basis, and without his intervention. The problem with referring the subject to the Prime Minister's

[127]See, for example, evidence given by Prof. Avishay Braverman, on July 30, 2001, and of Ronen Wolfman on August 8, 2001

[128] Comment made by Shaul Arlozoroff at a meeting held by the Committee with members of the Organization of Water Engineers, on December 23, 2001

[129] Evidence given to the Committee by Dr. Alon Tal, from the Arava Institute, on December 23, 2001

[130] Evidence given to the Committee by Avigdor Lieberman, on September 24, 2001

Office is, that the Prime Minister himself cannot take time out from burning political issues to deal with water on a daily basis, and it is not reasonable to assume that the Prime Minister's Office will decide to employ professional manpower specifically in order to deal with the water problem. Therefore, the Committee does not see any fault in leaving the responsibility at the strategic level in the hands of the Ministry for National Infrastructures, and that within its framework the Water Commission should be strengthened, until such time as an independent water authority is established. (See paragraphs 8.2.1. and 8.2.2.)
However, it is most important that a better coordination framework than that which exists today, should exist on the governmental level in the sphere of water. While it is important that the Ministries of Finance and Agriculture should make their unique contribution regarding the water sector, these Ministries are not in charge of determining Israel's water policy, and they should not be involved in blocking decisions on the strategic level, or the implementation of decisions on the tactical level. In our opinion, this goal will be attained should a Ministerial committee for natural resources, agriculture and the environment be set up, should the status of the Water Commissioner and the Water Commission be strengthened, should a reorganization of the Water Council be implemented, and should the Water Law be appropriately amended.

The Committee recommends, that until such time as an independent water authority is set up, the status of the Ministry for National Infrastructures, and the Water Commission by its side, should be strengthened, and the responsibilities of the other Ministries should be more clearly defined, in a manner that will enable them to make their unique contribution, without being able to block decisions and implementation in the sphere of water. The coordination among the Ministries will be implemented within the framework of the Ministerial Committee for Natural Resources, Agriculture and the Environment. (See paragraph 9.1.2.)

9.2.4. Structural Changes in the Water Council

One of the bodies which is supposed to operate, by force of the Water Law, in the decisions making process in the sphere of water is the Water Council. Today, the Council has 27-39 members - representatives of the Government, representatives of the Jewish Agency and representatives of the Public. At least two thirds of the members of the Council are representatives of the public, who represent the water consumers and water suppliers. At least half of these are representatives of the consumers, and an overwhelming majority are representatives of the framers. The Council is appointed by the Government (in fact, by the Minister for National Infrastructures), and its formal task is to advise the responsible Minister

on various issues mentioned in the Law, such as the water sector policy, laying down norms and rules for the use of water, declaring rationing zones and approving plans for water projects, laying down rules for calculating the price of water, and preparing a list of public representatives to serve in the water court.[131] The Minister for National Infrastructures serves as chairman of the Council, while the Water Commissioner serves as his deputy, but it is he who runs most of its meetings.

The Committee heard several witnesses who spoke of the operation of the Water Council. The director of the Licensing and Consumption Divison in the Water Commission explained:

> "The Water Council actually deliberates every change that we want to implement in the water sector, which involves changes in regulations, on such issues as water prices, water allocations, water cuts etc. We must go to the Water Council if we want to cut the quantities of water, and we have to deliberate the issue there. We present the issue to the Council, and it appoints a committee whose task is to hear objections from the public, and to deliberate the objections that reach it. So, first we must deposit our proposal for sixty days, so that the public can make its objections known, and relate to our proposals. After that, the Committee deliberates the objections, and then we must see whether or not the Ministers accept the recommendation of the Water Council. If they do, it goes into the process of signing the regulations, and their publications. In the best of times this process usually takes three to three and a half months. When we do not have cooperation, the whole business goes on and on".[132]

The representative of the Ministry of Finance gave a little more details regarding what his Ministry believes to be the root of the problem. He argued, that since most of the active members of the council are representatives of the farmers, the council manages to delay Government decisions, to which the farmers object.[133]

The former Legal Advisor of the Water Commission, Ora Tamir, presented to the Committee a slightly different point of view, with an historical perspective. She argued that while in the past the water policy was constructed from the bottom up, with real consultations with the Water Council, only after which resolutions were adopted by the Government, since 1977, the Water Council started being ignored. Today, Tamir argued, most of the relevant issues are cut in the Government and the Ministry of Finance, and the influence of the Council has diminished.[134]

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[131] The Water Law 1959, article 130a

[132] Evidence given to the Committee by Noga Blitz, on July 17, 2001

[133] Comments made by Erez Yamini

[134] Evidence given to the Committee by Ora Tamir, on July 10, 2001

Dr. Alon Tal, of the Arava Institute for the Environment ,suggested that the Water Council turn"from an advisory body only, into a body that makes decisions on matters of principle in the water sector".[135] The Council, according to this proposal, will include academicians from various disciplines, representatives of all the relevant Ministries, representatives of the local, municipal and regional councils, representatives of the green bodies, and representatives of the water associations.

Prof. Hillel Shuval proposed that the Council, that will be "an independent and professional body, that will also represent interests, and will be subject to the Government, but non-political", should be given the task of planning in the water sector.[136]

Dr. Eran Feitelson went into greater details on this issue, and proposed that the Water Council operate like the Council for Planning and Construction. The Council, in which all the various factors should be represented, and in which only the official representative or one regular replacement shall have the right to vote, will meet once every month, or two months or three months, and will determine policy. Government approval will be called for only regarding national issues. The Water Commissioner, who will, of course, be able to make proposals like any other Council member, will be the one to implement the policy decided by the Council, as the head of the Planning Administration in the Ministry of the Interior does today, on the basis of the decisions of the Council for Planning and Construction. In this manner a system of checks and balances will be created, and the political game can take place properly.[137]

The Committee recommends, that the Water Council should remain a body that advises the Water Commission or the independent Water Authority, once it is set up. In terms of its structure, the Committee recommends, that the number of the Council's members be significantly reduced, and its make-up changed, so that it will include experts and professionals, side by side with representatives of the Government and representatives of the consumers and producers. The representatives of the consumers should include representatives of the farmers, representatives of the urban consumers and representatives of the environmental bodies. In order for the Council to have a constructive role in the formulation of the policy, no interest group should have decisive influence over its recommendations or decisions.

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[135] Document sent to the Committee by Dr. Alon Tal, on December 23, 2001

[136] Interview with Prof. Hillel Shuval, from the Hebrew University, that was held with the representative of the Committee on February 3, 2002

[137] Interview with Dr. Eran Feitelson, that was held with the representative of the Committee on February 26, 2002

9.2.5. Ending the Crisis in "Mekorot"

The Government company "Mekorot" is the largest and most important executive body in the State of Israel in the sphere of the water sector (See paragraph 7.3.2.). However, since the end of the 1980s, it has been in dire financial and organizational straits.

The origin of the distress was that for years "Mekorot" operated on a cost-plus basis, with the Government covering the difference between its income and expenditure by means of a subsidy.[138] The main reason for the gap between income and expenditure, is that despite the fact that "Mekorot" supplies over 60% of the water to consumers in Israel, and many argue that it has a monopolistic status, it did not have in the past, and it does not have today control over water prices, and the prices of water did not cover the costs.[139] In addition, over the years Mekorot's capital eroded, since in the past the company's financial reports did not take into account depreciation and capital costs, and the Government used to determine the size of its development budgets.[140]

At the end of 1993, a "costs settlement" was signed among "Mekorot", the Ministry of Finance and the Ministry of Agriculture, that was to have settled the financial situation of the company, so that it would turn into a company with a capital fund of over a billion Shekels, on the basis of which it would be able to raise money in the capital markets.[141] According to the same agreement it was also decided that capital costs would be taken into account while determining water prices.[142]

In 1996 the Government decided upon a structural change of the company, that would lead to its division into several companies: one "Mekorot Assets Ltd.", the second "Mekorot Development Ltd." (that was to have engaged in the execution of projects in the sphere of water, sewage and drainage, sewage treatment, water filtration and desalination, and effluent reclamation plants), and the third "Mekorot Holdings Ltd.".[143]

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[138] Dalia Harel, dr. Joseph Dreizin and Nathan Meir, *Water as a National Resource - an Integrative View*, Tel-Aviv, December 1999 (Hebrew)

[139] In 1990, it was estimated in "Mekorot" that even if all the consumers would pay their bills in full and in time (which did not happen), there would still remain a deficit of about a third in the budget. See deliberations of the Knesset Economics Committee of October 31, 1990, on the subject of "the situation in 'Mekorot', its crisis and deterioration"

[140] Ibid.

[141] News paper cuttings from December 1993

[142] Comments made by Erez Yamini (the official in charge of water the Budgets Department of the Ministry of Finance) to the Committee on July 17, 2001

[143] Government resolution No. 733 (Ec/15) of November 13, 1996

Today the structural change is presented as follows: "Mekorot Holdings" will be fully owned by the state; the State and "Mekorot Holdings" will each hold 50% of the shares of "Mekorot Assets", that will hold the istallations of the National Carrier and assets across the Green Line; "Mekorot Holdings" will also fully hold "Mekorot Water Supply", that will be responsible for the current supply of water to the public, and the development of conventional water sources; and in "Mekorot Enterprises", that will compete with private firms for desalination tenders, the establishment of sewage treatment plants, the operation of water systems etc.[144]

However, to the present day the proposed reform has not been implemented, and even though it seems today that an agreement is closer than ever, the relations of the company with the Government are relations of uncertainty. Since 1998 the relations are based on an agreement that is renewed every three months.[145] In the meantime, the participation of the government in the "Mekorot" budget has gone down from NIS 611 million in 1993 to 165 million in 1998,[146] and in light of the company's unclear future, it has been coming across ever growing difficulties, when it approaches the banking system, in order to mobilize money.[147]

The complaints heard against "Mekorot", both in Finance Ministry circles and from factors external to the system, are many and varied. In the past it was said that the working force of "Mekorot" was too large. And indeed, in 1989 Mekorot's working force was cut by two thirds to 2,000,[148] and is today 1,620.[149]
A second complaint is that the employees of "Mekorot" are the salaried workers with the highest salaries in the country after those of the Electricity Corporation. Mekorot's answer is that its employees do much over-time, and that even if the salaries are high, the percentage of the cost of salaries of the price collected for water is less than 10%.[150] A third complaint is

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[144] Report by Amiram Cohen, *Ha`aret*, March 17, 2002 (Hebrew)

[145] Evidence given to the Committee by "Mekorot" Director General Amos Epstein, on July 15, 2001

[146] Evidence given to the Committee by Amos Epstein, on August 1, 2001

[147] Lecture by Amos Epstain to the Committee, during its visit to the "Mekorot" installations in Eilat on December 9, 2001

[148] Deliberation in the Knesset Economics Committee on October 31, 1990

[149] Comments made by former "Mekorot" Chairman Hezi Shelach, to the Knesset Economics Committee on october 31, 1990, and of current "Mekorot" Chairman, Major General (res.) Uri Saguy, to the Committee during its visit to the "Mekorot" installations in Eilat on December 9, 2001. At the peak of its activity, "Mekorot" employed more than 10,000 workers

[150] Comments made to the Committee during its visit to Eilat on December 9, 2001

that "Mekorot" is expensive.[151] "Mekorot" denies that it is expensive, but does not reject efforts to become more efficient in its operations.[152]

An additional focus of contention is connected with the spheres in which "Mekorot" may engage. The Ministry of Finance would like "Mekorot" to engage only in the conveyance of water and its supply,[153] while the heads of "Mekorot" want to participate, together with business factors, in the construction of sewage treatment and desalination plans. Around a year ago the Government gave in to "Mekorot", and agreed to enable it to construct a seawater desalination plant near the power station in Ashdod, as a turn-key project (in other words, "Mekorot" will construct the installation but hand it over to someone else for operation), and this after it presented short time-tables, a low price and undertook to issue a tender for the operation of the installation. However, according to the representatives of the Ministry of Finance, "'Mekorot' did not live up to any of the conditions that it itself set"[154], and the Accountant General of the Ministry of Finance, threatened to cancel the whole deal. "Mekorot" argues, in response, that this is simply not true.[155]

The Committee heard from two former Ministers of Agriculture, that despite the problems in the operation of "Mekorot", due to the emergency situation it ought to be allowed to act immediately on the issue of effluents.[156] In general, from much of the evidence that the Committee heard, no one denies that "Mekorot" is a qualified and professional company.

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[151] See for examples comments made to the Committee by the representative of the Association of Farmers in Israel, Yoram Tamari, on July 17, 2001, comments made by Gil'ad Riklis from the Budgets Department of the Ministry of Finance during at the symposium organized by the Water Commission on the subject of the Master plan for the development of the water sector, that took place at the agricultural compound in Beit Dagan on January 30, 2002, and interview with Prof. Hillel Shuval from the Hebrew University, held by the Committee's representative on February 3, 2002

[152] Lecture by Uri Saguy

[153] Comments made by Gil'ad Riklis, on January 30, 2002

[154] Comments made to the Committee by Hagai Miller and Erez Yamini of the Ministry of Finance, on January 21, 2002

[155] Evidence given to the Committee by Menachem Priel, Director of the Desalination Unit in "Mekorot", on January 21, 2002, in which he said: "'Mekorot' published a tender in accordance with the Government's decision. On February 5 we shall receive the proposals, and we estimate that around April-May, around Passover, we shall complete the technical classification, and then the financial classification, and the signing of the contract. Later, as "Mekorot" has declared, the execution will go on for 18-20 months. In other words, two years from today"

[156] Evidence given to the Committee by Ya'acov Tsur and Haim Oron, on August 12, 2001. Tsur spoke in favor of "Mekorot", even though during his tenure of office as Minister of Agriculture (1992-96), he held a relentless battle against it. Oron, (who was Minister of Agriculture in 1999-2001), said that he remembers "coming to (the Minister of Finance) Beiga Shohat, and yelling at 11 PM: 'stop this

An additional problem that was mentioned is that in the absence of a final decision regarding the future of "Mekorot" - it is unclear whether the company will be privatized, divided or left more or less in its current make-up - "'Mekorot' is playing the game in order to preserve the power that it has in its hands".[157] The absence of a decision results in the company acting for years in a state of schizophrenia, between being a private company and being a national factor.[158]

According to the Master Plan (transition) for the Development of the Water Sector in the years 2002-2010, that was presented by the Planning Division of the Water Commission on January 30, 2002, out of NIS 17,105 million that must be invested in development projects by the year 2010, in order to stabilize the situation of the water sector in Israel, "Mekorot" is supposed to invest 9,672 million - in other words, more than one billion Shekel per annum. (See table No. 10). However, according to the Director of the Planning Division in the Water Commission, in the years since 1993 "Mekorot" performed on average works at a level of around NIS 500 million per annum - in other words, only half of what is expected of it now, and he fears that the execution capacity of the company will be limited due to difficulties in mobilizing funds and "limitation placed by the Ministry of Finance" on the company.[159] There is no doubt, that even if the Master Plan will not be executed, "and what was is what will be", "Mekorot" cannot continue to operate efficient and at the required level of credibility, if the situation is not changed in the near future.

For many years, and despite resolutions of the Government on the subject, the crisis between "Mekorot" and the Government was not terminated, and accusations were bandied about on the question who is responsible for the situation. In addition to mutual accusations between the Ministry of Finance and "Mekorot", is was argued by the representatives of the Ministry of Finance who appeared before the Committee, that it is the Ministry of Justice and the Government Corporations Authority that are delaying a settlement,[160] while the

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argument about 'Mekorot'... let Amos Epstein (the Director General of 'Mekorot') work, because he is the only one that can do it now, and continue the fight with them later'."

[157] Interview with Dr. Eran Feitelson, held by the Committee's representative on February 26, 2002

[158] Evidence given to the Committee by Prof. Uri Shamir, on November 25, 2001

[159] Statement by Dr. Yossi Dreizin at the symposium organized by the Water Commission on the subject of the Master plan for the development of the water sector, that took place at the agricultural compound in Beit Dagan on January 30, 2002

[160] Evidence given to the Committee by Ronen Wolfman, on August 8, 2001

representatives of “Mekorot” argued that it is the State Attorney who is responsible for the delay.[161] Lately, the Committee has been informed that understandings have been reached between the Ministry of Finance and “Mekorot”.

The Committee was impressed by the activities of “Mekorot” that it saw, and by the fact that the company has prepared itself in practical terms to fulfill a central role in the development of the water sector, in coordination with the Water Commission.
The Committee is sorry that for over a decade its status, structure and tasks were not finally determined, which damaged its ability to act effectively. The on going struggle between the Ministry of Finance and “Mekorot” has not improved the situation in the water sector.
Therefore, the Committee welcomes the understandings recently reached between the Ministry of Finance and “Mekorot”, and calls upon the factors involved in the negotiations, to finalize the settlement between the sides, and upon the Government to approve it as soon as possible. [162]

9.2.6. The Question of Privatizing the Water Sector

The treatment of the “Mekorot” issue (See paragraph 9.2.5.), as of many other issues in the water sector, raises the question to what extent the water sector ought to be run by Government authorities and companies, or whether it should be handed over - at least partially - to private hands. The Arlozoroff Report dealt with this issue in some detail:

> “Water and sewage services are usually provided by public companies, that are Government owned. The exception in this sphere are several states in Europe such as France, Spain and recently also Britain, in which these services are controlled by the private sector.
> In the last decade, many states in the world, including developing countries, reached the conclusion that the services provided by Government companies suffer from many shortcomings, and that at least some of the functions connected with the supply of water, and sewage should be transferred to the private sector.
> One should differentiate between the term 'privatization', that usually relates to the transfer of ownership over installations, shares of the company and all the functions connected with the supply of services, to private companies, and ‘associating the private sector’, that relates to transferring part of the functions connected with the supply of services, to the private sector, where ownership over the installations remains

[161] Evidence given to the Committee by Amos Epstein, on July 15, 2001

[162] The structural change of "Mekorot" was finally approved by the Government on July 31, 2002 - the translator

[163] Annex I in Shaul Arlozoroff chairman, *Report of the Committee for examining the Administration of the Supply of Water in Israel*, Tel-Aviv, April 1997 (Hebrew)

> in the hands of the Government.
> The experience gained in various places in the world, shows that association of the private sector can ensure more stable and efficient management, in order to supply the consumer with services on a higher level, and enable the mobilization of private capital to cover part of the necessary investments, and thus prevent or limit the need for Government subsidization".[163]

It seems as though Israel has adopted this approach almost fully, as this manifests itself in the privatization of "Tahal" in 1996, in the Water and Sewage Associatiosn Law of 2001, the seawater desalination tenders, the tenders for desalinating brackish water, and tenders for the establishment of sewage purification plants.

At least three of the witnesses who appeared before the Committee dealt with the issue. Thus, Prof. Hillel Shuval argued that the problem with "Tahal"(and in fact also with "Mekorot") was that both had an interest in planning and building, because that was how they made a living.

> "If one does not build one cannot make a living. In my opinion, one can attain good planning advice from the private market... The commissioning of planning must come from a Government office, and finally it must receive the approval of the Government and be binding".[164]

Dr. Eran Feitelson explained that the key word is not privatization but competition. What is the point of privatization of a natural monopoly, if in the process of privatization you lose the capacity to supervise what goes on in the monopoly, and the profits simply pour into the pockets of an individual capitalist? The situation is different when one can maintain real competition, as in the case of the establishment of desalination plants or purification plants.[165] As Prof. Uri Shamir sees it:

> "Privatization must enter the water sector in a much more extensively manner than today. If we divide the water sector into three blocs: production, conveyance and distribution... on the production side one can privatize almost fully, as occurs today... That does not include the natural systems - only the artificial systems, that include sewage, brackish water and seawater desalination. In the main conveyance system there is a natural monopoly. No one will construct another national carrier, nor the regional systems... The conveyance system will be run by a private company or a Government company, it does not matter which, but it must be regulated... On the side of distribution, in the urban systems, there is already a pretty massive movement in the direction of privatization".[166]

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[164] Interview with Prof. Hillel Shuval, held by the representative of the Committee on February 3, 2002

[165] Interview with Dr. Eran Feitelson, held by the representative of the Committee on February 26, 2002

[166] Evidence given to the Committee by Prof. Uri Shamir, on November 25, 2001

It should be noted, that recently second thought have emerged in the world regarding the direction of this development. Thus, in the international water conference, that took place in Bonn in the first week of December 2001, and dealt with the world water crisis, many speakers mentioned that:

> "In most of the countries and cities in which the water sectors were privatized, a deterioration took place in the quality of water and the maintenance of water enterprises - and the prices of water to the consumer rose. Furthermore, the taxpayers in these countries were required, by means of their governments, to guarantee the profitability of the private companies, that purchased the public and government water enterprises and water companies... The speakers said that the argument by which the international tenders for the management of water sectors create competition and lead to low prices, has not been proven in reality. One of the reasons for this is the control of international giants over the water industry, and the management of water sectors...".[167]

One should not ignore the fact that in a small state like Israel, the opening of the market to free competition in branches in which large investments are required, could lead to monopolistic take-overs of them. Recently such concerns have emerged regarding the desalination branch, and this since there is a reasonable possibility that the V.I.D. groups, that is made up of Dankner and Eldan Investments, Desalination Engineering and the International corporation Vivendi, that won the first desalination tender in Ashkelon, will win a critical mass of the desalination tenders, and as a result of this other groups will avoid offering bids in future desalination tenders.[168]

The Committee was impressed that bringing in private factors into the water sector is a positive phenomenon, but it wishes to warn, that there are spheres of activity that should remain in the hands of public bodies, such as, for example, planning on the national and regional level, overall responsibility for the establishment of national systems (such as pipelines, aquifer recharging systems and reservoirs), and the direction and encouragement of research. On the other hand, there are spheres of activity, in which it is desirable that private factors should participate on a competitive basis, especially when one is speaking of the construction of large enterprises, such as desalination installations, and sewage purification plants, and the supply of water and sewage services on the municipal level. The Committee recommends that the decision makers should learn from the experience of other states, on the issue of transferring parts of the water sector to private hands.

9.3. Legislation and the Legal Sphere

[167] Report by Amiram Cohen, *Ha`aretz*, Decmeber 6, 2001

[168] Article by Amiran Cohen, *Haqaretz*, April 14, 2002

As was mentioned in the chapter that reviewed the legal issue (chapter 5), the legal situation in the water sector is quite complex. Nevertheless, at least three of the witnesses who appeared before the Committee praised the Water Law. The first legal advisor of the Water Commission, former Member of the Knesset Modechai Virshuvsky, pointed out that even though one is speaking of a relatively old piece of legislation, it emphasizes the fact that the State understood, the importance of the water issue and the water shortage, already in its early years.[169]

Prof. Yo`av Kislev went further in saying that:

> "Our Water Law, according to which water is public property, is a progressive and enlightened law, and perhaps there is no such law anywhere else in the world. There is a great destruction of water resources, especially subterranean sources, in many parts of the world, and we have a law that can help us prevent this".[170]

Dr. Alon Tal made some reservations tot he compliments that he himself gave the Water Law:

> "When (the Water Law) was enacted in 1959, it was thought that it is the best law in the world. It was amended in 1971 and since then we have not seen any refreshment... One of the conclusions of a survey (prepared by the Arava Institute for the Environment) is that it is necessary to amend the Water Law, and also add the issue of water for nature".[171]

There is no doubt that the legislation on the water issue in general, and the Water Law in particular, require amendment and deep and fundamental treatment. Therefore, the Committee congratulates the Ministry for National Infrastructures and the Legal Department of the Water Commission for their current activity in this direction, while being aware of the problems facing them.[172] The Committee also welcomes the initiative of various extra-governmental bodies, such as the Nature Preservation Society, the Arava Institute for the Environment and "Man, Nature and Law", that are active in trying to ensure the enforcement of existing laws and their amendment.

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[169] Evidence given to the Committee by former MK Mordechai Vershuvsky, on July 9, 2001

[170] Evidence given to the Committee by Prof. Yo`av Kislev, on August 13, 2001

[171] Evidence given to the Committee by Dr. Alon Tal, on December 23, 2001

[172] In his evidence to the Committee on September 24, 2001, former Minister of National Infrastructures, Avigdor Lieberman, reported that his office is working on the preparation of a Water Sector Law, and added that he does not "see at the moment, given the balance of forces in the Government, that our bill will receive the Government's blessing, and that there will be a Government bill. Even if it does not receive the Government's blessing, we shall act by way of private legisaltion".

9.3.1. The Integration of the Water Laws while Laying Down a Spatial Policy

While the water cycle is a single process that begins with the first drop of water that falls to the ground, continues with the drainage of the water drops, their seepage into the ground water, water production, the distribution of water to consumers, the turning of the water into sewage, the conveyance of the sewage and the water to be purified, and their reuse as effluents, the legislation that regulates the water sector in Israel is scattered over many laws and regulations.[173] As a result of the fragmentation in the regulation of the issue, the reality is that its treatment is in the hands of many factors, and is totally lacking in a spatial approach, which could enable supervision of the system's operation. This also makes the proper enforcement in many spheres difficult.

The subsidiary legislation is problematic because frequently there is no need for its approval by one of the Knesset Committees, and thus a situation is created in which the public's representatives are not real and full partners in the water policy.

The Committee recommends that the main water laws be regulated under a single comprehensive umbrella, from which it will be possible to learn about the policy of the legislator on the water issue, and the powers of the various bodies. In addition, it is proposed that important issues, which are dealt with today in regulations and subsidiary legislation, will be included within the framework of the main legislation, both in order to raise public awareness to these issues, and in order to improve their enforcement.

9.3.2. Adapting the Legislation to the Changing Reality

The water Law and additional laws dealing with water, do not reflect the existing situation in practice. Thus, for example, Government resolutions regarding the transfer of powers to the Minister for National Infrastructures, were not backed by an appropriate amendment in the Water Law. Also the water level of the Sea of Galilee, that is fixed in the Water Ordinance (determining the level of the Sea of Galilee) 1968, [174] is not updated in relation to the actual

[173] Evidence given to the Committee by attorney Denis Goldman, on July 10, 2001

[174] This Ordinance is enacted by force of the Water Regulations (fixing the permitted level) 1967, and is updated from time to time. Recently, several private members' bills have been proposed, whose goal is to fix the permitted level in primary legislation (by means of an addition that can be updated), and this because of the discrepancy between the instructions of the primary legislation and the instructions of a secondary law. See below.

pumping. In addition, as a general rule, the legislation does not foresee emergency situations, but only reacts to them. Thus, for example, the legislation is not prepared to deal efficiently with water saving in dry years.

The legislation is also behind with regards to the organizational and institutional changes, that have taken place over the years in the water sector, and does not enable changes that appear today to be important. Thus, for example, in light of years of unbalanced management of the water sector, a proposal was brought up to force the Water Commissioner, by law, to run a balanced water sector, and to give him the tools to do this. According to the Director General of the Ministry for National Infrastructures, Ya`ir Ma'ayan, the Water Sector Law that his Ministry is preparing,

> "is designed to settle the regulating status of the Commission, as well as some form of independent body that will fix the price of water in future, without being influenced by the Knesset Finance Committee, or by the Ministers, and will be much more independent".[175]

The Committee recommends that the various Government resolutions adopted on water issues, be backed by appropriate legislative amendments, and designate, by means of legislation, more flexible powers with regards to water saving in dry years, when one cannot manage the water sector in a routine manner. In addition, the Committee recommends that the water laws enable broad and flexible interpretation regarding the possibilities for innovative uses of water (such as desalinated water), resulting from technological developments.

The Committee recommends that the legislation be amended, so that it will reflect the institutional changes that have taken place over the years, and the desired changes in future, especially in the sphere of the Water Commissioner's and Water Commission's powers in the interim period, the structure and powers of the Water Council, the establishment of an independent water authority in future, and a cut in the number of bodies dealing with the water issue. (See paragraphs 9.2.1. and 9.2.4.)

9.3.3. Simplifying the Bureaucratic Procedures

The procedures that are fixed in the Water Law for the adoption of decisions by the executing bodies, are frequently awkward. Thus, for example, despite the fact that the Minister for National Infrastructures has extensive powers regarding the regulation of the use of water in rationing zones, the process for laying down the policy by the Minister (which is fixed in

[175] Comments made by Ya`ir Ma'ayan at the symposium organized by the Water Commission on the subject of the Master plan for the development of the water sector, that took place at the agricultural compound in Beit Dagan on January 30, 2002

articles 37 to 41 of the Law) is extremely complicated. The process includes consultations with the Water Council and the Supply Committee, presenting a detailed plan to the Water Commission and the local authorities, and enabling every water consumer in a rationing zone, where the price of water which is supplied to him is about the rise as a result of the new arrangement, to object within 60 days of its being published. The Minister is not entitled to implement a regulation, unless he has given every opponent the opportunity to sound his arguments before the Water Council, or one of its committees. This process involves a lot of bureaucracy, and is thus liable to take quite a while. The snag is that when a quick cut in the use of water in a certain area, or for a specific purpose, is required, the change must implemented rapidly, by means of a procedure that is short and simple to enact. The existing bureaucratic process no longer tallies with technological changes, such as the fax and Internet, that enables anyone who feels that he has been harmed as a result of a particular decision, a rapid and simple opportunity to express his reasoned position.[176]

In this connection it is possible to reconsider the need for a special water court.[177] On the one hand, it might be preferable that the powers of the existing court be increased, and that it be viewed as a body authorized to decide on any legal claim that involves the water sector in Israel, and in this way will also act as a deterrent. On the other hand, it is not clear whether there is any need for such a court, and perhaps one can make due with the ordinary court system.

The Committee welcomes the initiative of the Water Commission to simplify the bureaucratic process by changing the procedures laid down in the law, and recommends that the legal procedures, all along the policy-making and implementation process be examined, and simplified.

[176] In a memorandum on the Water Law, that was recently distributed by the Water Commission, there is a proposal to shorten this process, in cases in which the Water Commissioner warns the Minister for National Infrastructures about a serious water shortage, resulting from extreme hydrological and climatic conditions. According to the proposed amendment, in such a case, the Minister will be entitled to issue regulations in consultation with the Water Council, but without consulting the supply committees, and without publishing a proposal for a settlement, by means of the procedure described above; whoever feels that he is liable to be harmed by the proposed regulations, will be entitled to present his arguments, within 10 days of the publication of the Minister's announcement regarding the introduction of the settlement as stated, to a committee that will be appointed from among the members of the Water Council; the Committee will decide on the matter within 10 days, in order to speed up the process, and enable the Water Commissioner to refer his recommendations to the Minister for National Infrastructures, within as short a time as possible.

[177] Today the District Court in Haifa also serves as a court for water matters.

9.3.4. Enforcement Policy

The tasks assigned to the Water Commission under the law, are numerous and heavy. At the same time, the tools provided for enforcing the decisions and the powers are few. The problem is especially serious in the sphere of water preservation, water saving by public bodies, and the contamination of water by industrial enterprises. From the evidence given by former Minister for National Infrastructures, Avigdor Lieberman, the Committee learned of his failure to introduce a 15% cut in the consumption of water by local authorities in 2001, compared with 2000.[178] Today, the enforcement of regulations dealing with the saving of water is implemented primarily by municipal inspectors in the local authorities. Recently, the Water Commission has authorized inspectors to enforce the various saving regulations.

In Israel civil enforcement hardly exists. It is possible that the development of a system of civil enforcement, will cause the public to feel that it is a partner to decisions on the issue of the water sector, and this will encourage it to save. From the experience of states in which a plan for saving was made by means of the public, the Committee learned, that effective enforcement is a function of greater participation by the public in the process by various means. Thus, for example, it is possible that by means of the ability to present complaints or representative claims, on issues concerning the preservation of water, the saving of water and contamination, it will be possible to raise public consciousness regarding the importance of preserving the water and its quality. It is also possible to publish for the public, in an orderly manner, all the regulations and rules dealing with the saving of water, including gadgets for saving water, that are recommended by the Saving Division in the Water Commission.

The Committee recommends that clear instructions, regarding the ways for enforcing the water laws, that will provide the authorities real tools to execute the task, be entrenched in legislation. First and foremost, it is proposed to strengthen the powers of the Water Commissioner, and enable him to implement the powers assigned to him in the law in an efficient and simple manner, as for example by means of the option to fix damages as a means of punishment. The Committee suggests that as a general rule simple enforcement procedures be laid down, such as offences for which there is the choice of standing trial at various rates, especially in the sphere of the saving and preserving water.
The Committee welcomes the trend, which is becoming apparent, for cooperation between the local authorities, and the Ministry for National Infrastructures and Water Commission, in order to increase the municipal enforcement, and hopes that this trend will strengthen.

[178] Evidence given to the Committee by Avigdor Lieberman, on September 24, 2001

The Committee recommends that the various ways will be examined to made enforcement more efficient, by increasing the awareness of the public to the water laws, and the possibilities for implementing them.

9.4. Saving Water

When there is an imbalance between supply and demand for a particular commodity ,one can solve the problem by means of its price, or, in so far as one wants to preserve a certain level of prices, by increasing the supply of the commodity, and/or reducing the demand for it. Since the State decided to deal with the problem in the second way (to the great chagrin of most of the economists and Ministry of Finance officials), and since increasing the supply by means of sewage reclamation, brackish water and seawater desalination, and importation, is not something that one can do overnight (and increasing the supply by means of rain is mostly in heaven's hands), at least during an interim period of two to three years, there is great importance to the saving of water - in other words, a thrifty use of water.

In addition to the time advantage, saving has an additional advantage - it is cheaper than producing water. Yona Kahane explained this as follows:

> "Saving in itself is a source of cheap, available and immediate water. But when you speak of desalination compared to saving, desalination drags behind it a train of additional expenses. This involves extending pipelines, whether conveyance lines, belonging to "Mekorot" or others, or urban lines... In addition, the sewage system, and the sewage treatment system will have to grow. So the comparison is not between 50 cents (for desalination) and perhaps 10-20 cents, but between 70 cents or more compared with 10-20".[179]

Saving can be implemented in two ways: by means of an administrative decision - in other words, allocations or the fixing of quotas, or in a voluntary manner.

During his first appearance before the Committee, the Water Commissioner explained that out of a deficit of 500 Million Cu.M created in the water sector, the Commission seeks to cut an additional 100 Million Cu.M from the quotas for agriculture, and to bring about a saving of

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[179] Comments made by Yona Kahane at the symposium organized by the Water Commission on the subject of the Master plan for the development of the water sector, that took place at the agricultural compound in Beit Dagan on January 30, 2002. A similar idea appears in a document written by Hezi Bilik in December 2001, under the title *Saving Pays*, which he handed over to the Committee

100 Million Cu.M in the city, part of which will be implemented voluntary and part (like drying up lawns) will be implemented administratively.[180]

9.4.1. Allocation of Water - Quotas

The allocation of water for various uses is a way of dealing with a shortage, where the goal is to fix maximal quantities for each use. In 1961 an allocation (rationing) of water was effected for all the various uses - agricultural, urban and industrial.[181] In the meantime the allocation to local councils has been cancelled.[182]

The first cut in quotas for agriculture (in other words, saving based on an administrative decision) took place during the 1986 water crisis, when the Water Commissioner,Zemah Yishai, proposed a 250-300 million cubic meter cut.[183] Since then use was made of this tool several times. At the end of 2001 the Water Commissioner sought to cut 73% from the quotas (fixed in 1989) for 2002, but was granted a 50% cut "only".

The allocations for industry are made once a year, on January 1, and they are determined on the basis of production norms. The allocations for agriculture are decided twice a year - on January 1, when 75% of the quota is allocated, and on April 1 (after the rainy season is over) when the rest is allocated. However,

> "What has happened in the last three years is that these regulations simply aren't working, because we cannot allocate 75 percent on January 1, since we know in advance that we do not have water".[184]

Paradoxically it was the representative of the Budgets Department in the Ministry of Finance who expressed understanding for the distress of the farmers in the current situation.

> "Rules should be set for the *modus operandi* after a year of drought, so that the farmer will know in advance how much is going to be cut. What happens at the moment is that we are at the beginning of January, and the farmers still do not know what their water quota will be from next week onwards... An additional problem is ,that today the quotas are fexed according to the financial year - from January to January - when it is more

[180] Evidence given to the Committee by Shimon Tal, on July1, 2001

[181] Evidence given to the Committee by Mordechai Virshuvsky, on July 9, 2001

[182] Evidence given to the Committee by Oshri Frost, the Legal Advisor of the Water Commission, on July 10, 2001

[183] Evidence given to the Committee by Zemah Yishai, on July 9, 2001

[184] Evidence given to the Committee by Noga Blitz, the Director of the Licensing and Consumption Division of the Water Commission, on July 17, 2001

logical to determine them according to the rainy season - in other words, from April to April, when we already know what sort of winter we have had".[185]

The Ministry of Finance supports the abolition of allocations on principle, both for industry and agriculture, since it views it as a system that is opposed to economic logic. Regarding agriculture, the system raises opposition also because it opens a gateway for waste and in exceptional cases even to corruption. Even the current Minister of Agriculture admits that the existing system has gone bankrupt.[186]

However ,there is no doubt that until the water sector is returned to a state of balance, and since voluntary saving can only succeed to a limited extent, it will be necessary to continue with allocations, if one wishes to avoid over-pumping. Shaul Arlozoroff proposed that as long as there is need for the allocation of water in the State of Israel, it should be laid down in the law, that it should be a function of the state of the reservoirs.[187]

The Committee supports the gradual abolition of the system of water allocations, but recommends that as long as the system of allocations for agriculture continues to exist, it should be done in a manner that will enable the farmers to plan the year according to the agricultural year, and not according to the financial year.

9.4.2. Water Saving in the Various Sectors

The approach to the subject of water saving in Israel is unsatisfactory. According to Yona Kahane, while in ancient Egypt Joseph saved and accumulated in years of plenty and spent in years of shortage, we act in the opposite manner - we try to save in years of shortage after we have wasted in years of plenty.[188]

There is no doubt that there is an urgent need to educate the Israeli public to save water - or how not to wastewater - in all seasons of the year, both in rainy and dry years, and in all spheres .Many bring as a success story, the education of the public in the 1960s not to pick

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[185] Comments made to the Committee by Erez Yamini, on December 23, 2001

[186] Evidence given to the Committee by Minister of Agriculture Shalom Simhon, on August 8, 2001

[187] Evidence given to the Committee by Shaul Arlozoroff, on December 23, 2001

[188] Prof. Dan Zaslavsky, *The Face of water in Israel*, the Ne`eman Institute in cooperation with the Jerusalem Center for the Israel Studies and "Haim Usviva", July 2001, p. 72

wild flowers. The education must take place within the framework of the various levels of the educational system, and within the framework of the written and electronic media.
At a symposium that took place at Beit Berl on March 21, 2002 ,under the title "The Water Sector in Israel and the Ramifications on the Educational Level", several ideas were raised regarding the correct way to educate the public. [189] In addition to education, for the last two years, the Divison for Advancing Water Saving in the Water Commission, has been pushing the subject of implementing regulations in this sphere.[190]

The Municipal Sector

In the period of the 1990/91 water crisis, there was a campaign for saving water in the municipal sector, that was considered a success. The campaign managed to cut consumption by around 100 Million Cu.M for non-agricultural uses - especially in households. However, the results of the campaign vanished following the rainfalls of 1991/92.[191]
According to the Water Commission, several water saving gadgets were introduced in 1991, but at the time there were only two that conformed with the Israeli standards, and there is no longer any trace of them in the Israeli market.[192]

Despite the positive experience of the 1990/91 campaign, there has been an inexplicable delay in the current crisis in the adoption of measures. Thus, for example, a resolution was adopted in the Ministerial Committee for Economics on December 21, 1999, to reduce the municipal consumption of water by around 80 Million Cu.M, but the resolution was not implemented.[193] In the Government resolution of April 2001, article 3 dealt with various aspects of reducing the demand for water,[194] that *inter alia* required various activities in the sphere of legislation and the introduction of regulations. One of the clauses spoke of a legislative amendment that would enable the imposition of financial fines, for breach of the instructions of the Water Law, and breach of regulations concerning the saving of water.

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[189] See for example, Dr. Rony Aviram, head of the Center for Futurism at Ben-Gurion University, spoke of "Didactic and Educational Ramifications of an Interdisciplinary Program on the Water Issue"

[190] The Ministry for National Infrastructures - the Water Commission, *Master plan (transition) for the Development of the Water Sector in the Years 2002-2010*, Final Report, April 2002, p. 20

[191] Prof. Dan Zaslavsky, *The Face of water in Israel*, p. 70

[192] Evidence given to the Committee by Yaacov Lev, Director of the Division for Advancing Water Saving in the Water Commission, on July 26, 2001

[193] Background paper regarding Government resolutions in the sphere of the saving of water, presented to the Committee by Erez Yamini

[194] Government resolution No. 115 (SC/2) of April 18, 2001

Following this resolution the Government proposed an amendment to the Water Law, that would enable the inspectors of the local authorities, to supervise the implementation of the regulations regarding the saving of water, with the fines collected for legal transgressions being paid into the local authority treasury.[195] The Bill passed first reading on February 11, 2002, and was referred to the Economics Committee. In other words, despite the emergency situation, and the need to act rapidly, it will take more than a year before this decision is implemented, if at all.

In August 2001 the Ministry for National Infrastructures started an aggressive campaign in the media for water saving, with the basic message being not to leave the faucet open beyond what is necessary. Later on the campaign moved to water saving gadgets. In September the Government adopted a resolution to distribute water saving gadgets as gifts to civil servants.[196]

The Committee heard the report of the Director of the Division for Advancing Water Saving in the Water Commission, regarding the actions taken by him, in cooperation with the Ministry for Industry and Trade, the Institute of Standards, and the Water Administration in the local authorities, for introducing water saving gadgets into households, offices and enterprises.[197] The Committee also received from him a list of such gadgets, that had obtained a standards mark (it transpires that most of the gadgets in the market do not have a standards mark). These include a dual-quantity toilet flushing device, which is more efficient than the one that was previously in use, a dual-quantity device that can be attached to any single-quantity flushing device, a urinary for men that does not require water, a metal gadget for limiting the flow of water in faucets, a metal gadget for limiting the flow of water in showers, a plastic gadget for limiting the flow of water, an economical shower head, an economical hand-shower, a semi-automatic faucet, and watering regulators for gardens.[198] The problem is in the distribution of gadgets, and there is undoubtedly a need for a decision in principle to distribute them in a more aggressive way than in the past - whether by means of Water Commission and/or local authorities inspectors, or by means of volunteers, including pupils. Regarding one of the proposals for the saving of water in households - the recycling of domestic wastewater, the Committee was informed that the Ministry of Health

[195] Water Bill (amendment No. 13) 2002, *Bills*, the Official Gazette, pamphlet 3070, January 21, 2002

[196] Government resolution No 716 of September 16, 2001

[197] Evidence give by Yaacov Lev

[198] Water Commission, *Directory for Water Saving Gadgets Inside Structures - a Blue Mark Means that I Save*, Tel-Aviv (no date)

objects to the use of installations for the recycling of such water in land attached houses, for health reasons (because it is impossible to ensure that sewage water does not mix with the domestic wastewater).[199]

All in all, the Water Commission would like to reach an average saving of 15 percent in the use of water in households, that will lead to a saving of around 100 Million Cu.M per annum.[200] Yona Kahane argues that it is possible to save every year around 150 Million Cu.M in the urban sector.[201] Shaul Arlozoroff spoke of 200 Million Cu.M.[202] Prof. Dan Zaslavsky, on the other hand, argued in his evidence to the committee that all the proposals for saving water in households actually save money - not water.[203]

The Committee heard a fascinating report on a method for saving that was implemented in households in Southern California in the United States in the years 1975-77. The method was based on the principle that every household received an annual allocation, that was 30-69 percent lower than its consumption before the system was implemented, at close to the usual price. Any divergence from this allocation raised the price collected very sharply. In this way 20-40 percent were saved, compared with previous years.[204] On principle, this system could work in Israel, even though it was pointed out to the Committee that the level of consumption in Israel, among all types of consumers, is lower by as much as 50% than that for similar categories in California, so that in actual fact it would be impossible to reach the same results that were registered in the United States.[205]

Despite the limitations, it seems as though the Water Commission would like to implement a similar plan in Israel. At a symposium on public administration, held in Jerusalem on March 6, 2002, the Water Commissioner, Shimon Tal, revealed a plan, according to which an average family will receive a water quota of 24 Cu.M per month, for which it will pay NIS

[199] Evidence given to the Committee by Moshe Avnon, Director of the Water Sector Administration, on July 31, 2001

[200] Water Commission, *Master plan (transition) for the Development of the Water Sector in the Years 2002-2010*, Final Report, April 2002, p. 19

[201] Comments made by Yona Kahane at the symposium organized by the Water Commission

[202] Evidence given to the Committee by Shaul Arlozoroff, on July 15, 2001

[203] Evidence given to the Committee by Prof. Dan Zaslavsky, on July 15, 2001

[204] Evidence given to the Committee by Dr. Peretz Dar, of the Jerusalem Institute for Israel Studies, on July 26, 2001

[205] Evidence given by Moshe Avnon

2.65 per cubic meter for the first eight Cu.M, NIS 4 for an additional seven Cu.M and NIS 5.87 for the last nine Cu.M. For every cubic meter above this, the consumer will pay NIS 20 (!) per cubic meter.[206]

An interesting debate, which exists among people in the water sector relates to the question to what extent it is proper to try and dictate to citizens how to use water. While Yossi Yishai argued that such interference is not acceptable, Yona Kahane replied that in all well run countries, including Europe and North America,

> "This is done in the sharpest manner... In the United States it has actually been done by means of Federal law... and only we remain with this problem, that there are still people who think that we may not tell people not to wastewater. Nobody is saying: 'don't take a shower every day'. What we are saying is: 'use your head'".[207]

The Committee was impressed, that in many spheres connected with the saving of water in households, such as the installment of double water systems (for different qualities of water) in new buildings, the installment of installations for catching rain water on roof tops or yards, and limiting the loss of the over-ground run-off water in cities due to concrete surfaces that do not permitted their seepage into the ground water[208] - subjects that the Water Commission is dealing with in cooperation with the Technion[209] - we still have a long way to go before the necessary standards and regulations will be approved, and practical plans to implement them are put into force.

Local Authorities

Since the local authorities use funds that they collect from the citizens for water, not only for the purpose of improving the water and sewage systems, they have no incentive to bring about saving in water - on the contrary.[210] The Committee gathered that one of the goals of the legislation, that will enable the local authorities to collect fines for breach of the

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[206] Report by Amiram Cohen, *Ha`aretz*, March 7, 2002

[207] Comments made by Yossi Yishai and Yona Kahane at the symposium organized by the Water Commission on the subject of the Master plan for the development of the water sector, that took place at the agricultural compound in Beit Dagan on January 30, 2002

[208] According to a study prepared at the Technion, every year around 70 Million Cu.M of run-off water is lost, because it cannot seep into the ground. See, the *Master plan (transition) for the Development of the Water Sector in the Years 2002-2010*, Final Report, April 2002, p. 23

[209] Evidence given by Yaccov Lev

[210] Evidence given to the Committee by Avigdor Lieberman, on July 26, 2001

regulations regarding the saving of water, and to put the fine money into their treasury, is to encourage the local authorities to cooperate with the saving effort.

Public Institutions and Government Bodies

In the sphere of saving in public institutions and Government bodies, it seems as though the Government is acting vigorously. In July 2001 the Government adopted a resolution regarding the installation of water saving gadgets in the Ministries, the Government corporations and other public associations and bodies.[211] While attending a meeting of the Water Sector Emergency Staff, that took place at the Ministry for National Infrastructures, the representatives of the Committee were impressed that indeed a serious effort was being made by the Water Commission to check, to what extend this resolution is being implemented. *Inter alia*, it was reported that in the Ashdod Harbor, for example, there is still a great waste of water.[212]

Industry, Trade and Services

The Committee heard from the representatives of the industrialists, that in the industrial sphere there is already, in practice, almost optimal saving in the use of water. In the sphere of trade, the use of water is relatively small, and regarding hotels the Committee was informed that there is place for saving, but the subject is sensitive because we are speaking of tourists who stay in hotels primarily for recreation purposes, and it is problematic to impose saving on them. Regarding the hotels along the coast, the Committee was informed that the possibility is being examined to desalinate the seawater that is pumped from the sea for the purpose of cooling, and the desalinated water might then be conveyed into the local water systems.[213]

During its meeting on July 25, 2001, the Knesset Economics Committee approved regulations regarding the washing of vehicles and tiled surfaces. According to the new regulations, it is forbidden to use installations for washing vehicles that do not have a system for recycling water, it is forbidden to use running water from the water system to wash vehicles, and it is forbidden to use running water from the water system, or pressurized water, to wash tiled surfaces.[214] Regarding the washing of vehicles, the Committee was informed that there exists

[211] Government resolution No. 510 of July 30, 2001

[212] Comments made by Noga Blitz at the meeting of the Water Sector Emergency Staff, that took place on March 4, 2002

[213] Comments made by the Deputy Accountant General in the Ministry of Finance, Yuval Bronstein, to the Committee's representative on April 21, 2002

[214] Water Regulations (Rules for Washing Vehicles and for Washing Tiled Surfaces With Water) 2001

a spray that enables cleaning without the use of water. The Committee heard that out of around 600 installations for washing vehicles throughout the country, only around 10 percent recycle water. Apparently, all the swimming pools in the country have recycling systems, and an installation of this sort is about to be approved for Mikvehs (Jewish ritual baths - the translator).[215]

Gardening

The Committee heard from many witnesses that gardening in Israel is illogical, when one is speaking of a country in which water is short. Yona Kahane complained that we have become accustomed to European style gardening, that is based on lawns that consume large quantities of water. He added, that already in 1959, a committee of specialists raised this issue with the authorities, but nothing was done about it.[216] Former Member of the Knesset Yosef Tamir, argued that "All through the years of the State's existence, there wasn't a single Water Commissioner who warned the gardeners and the mayors not to plant lawns".[217]
How much water goes into gardening in Israel? The Committee heard from the representative of the Ministry of the Interior, that we are speaking of around 180 Million Cu.M, of which 70 Million Cu.M are in the urban sector and 110 Million Cu.M are used for gardening in the areas of Shefayim, Udim, Havazelet Hasharon etc. (settlements in the coastal area - the translator).[218] From figures supplied by the Water Commission it emerges that in 2000 the gardened areas in Israel amounted to around 200,000 dunams (~50,000 acres), of which around 130,000 are lawns. Since the annual growth rate is estimated at around 3.5%, the average consumption of water per dunam is around 900 Cu.M, and it is possible to reduce it by changing the types of plants being grown, and a change in watering methods to around 600 meters per dunam, "by means of correct watering and compliance with the regulations, it is possible to save 50-60 Million Cu.M of water".[219]

According to Prof. Avner Adin, in certain States in the United States, such as Arizona and California, as in Japan, South Africa and Australia, new neighborhoods are being built today in which the wastewater is recycled, *inter alia* for purposes of gardening and the watering of

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[215] Evidence given by Yaacov Lev

[216] Comments made by Yona Kahane at the symposium held by the Water Commission

[217] Evidence given to the Committee by Yosef Tamir, on July 19, 2001

[218] Evidence given by Moshe Avnon

[219] *Master plan (transition) for the Development of the Water Sector in the Years 2002-2010,* p. 22

local parks.[220] From the representative of the "Netafim" company, the Committee heard that the company is engaged in developing watering methods for parks, traffic islands etc. in local authorities, based on the instructions of the Ministry of Health,[221] and from the Water Commission is heard that it has "a regular team that offers instruction on the subject of water saving gardens".[222]

On July 25, 2001, the Knesset Economics Committee approved regulations that laid down limitations regarding the watering of parks and gardens, including the hours when one may do the watering (the Minister for National Infrastructures wanted to stop all watering of lawns during the summer months, but the Economics Committee refused to approve his proposal), and it was stated that the Water Commissioner shall act, in consultation with the Minister for the Environment, to publish recommendations "regarding the planning of water saving parks and the watering of gardens".[223]

Agriculture

One should take note, that in the sphere of agriculture, Israel is considered one of the leading countries on the subject of saving water .Since the 1950s and until the mid 1990s, the agricultural sector in Israel became more efficient in the use of water in an impressive manner. The quantity of water required to produce one kilo of dry-stuff went down by about 50% during this period. This impressive achievement was attained by using more efficient irrigation methods (especially the introduction of drip irrigation, and computerized irrigation systems), the development of plant systems that consume less water in order to produce the same quantity of dry-stuff, and reducing the consumption of water by means of green houses.[224]

The engineers of the Water Saving Division in the Water Commission, invest efforts

> "to ensure water saving and the efficient use of water, by offering advice to the Ministry of Agriculture, in examining irrigation plans, rehabilitating pipelines and pumping equipment, adapting supply pressures to optimal operation characteristics of water distributors, transition to more efficient irrigation methods, adapting filtering systems to various qualities of water, using electronic control and supervision systems, recycling

[220] Evidence given to the Committee by Prof. Avner Adin, from the Hebrew University, on August 12, 2001

[221] Evidence given to the Committee by Dubi Segal, on July 26, 2001

[222] Evidence given by Yaacov Lev

[223] Water Regulations (the Use of Water in Rationed Areas) (amendment No. 4), 2001

[224] Evidence given to the Committee by Prof. Zeev Gerstel, Director of the Institute for Soil, Water and Environment Sciences in Beit Dagan, on July 30, 2001

water in green houses, etc.".[225]

Despite what has been said above, the Committee was impressed that when one speaks of reducing demand for water in agriculture today, we are speaking less of additional saving in the use of water, and more of cuts and stopping to grow certain types of agricultural crops, that are water guzzlers.

The Committee welcomes all the actions taken by the Water Commission and other authorities in order to bring about a real saving of water, even though these actions have come late and are insufficient. The Committee regrets that in the last year various factors in the Government system have not cooperated sufficiently with the Water Commission with regards to water saving in certain sectors.

The Committee recommends, that considered use be made of combining incentives and rulings, to attain an efficient use of water in all the sectors - technologies for the efficient use of water, and for water saving building and incentives for using them; gardening which is suitable for the climate in the country; a water pricing mechanism that does not encourage waste; education and information for all parts of the population; laws and regulations implemented for the long run, and in times of shortage.

The Committee was impressed by the fact, that in the spheres in which regulations, gadgets and techniques for saving water exist, without the employment of sufficient inspectors, who will be employed to supervise the fulfillment of the regulations and the marketing of the gadgets and techniques, it will be impossible to reach sufficient levels of saving. Therefore, the Committee recommends the allocation of sufficient resources, so that the Water Commission will be able to increase the number of its inspectors, and to complete the legislation that will enable the employment of inspectors for the issue of water saving in the local authorities, as soon as possible. The Committee recommends that even though the consumption habits in other countries, are not necessarily the same as those that exist in Israel, it is worth while learning from their experience.

9.5. Water Pricing

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[225] *Master plan (transition) for the Development of the Water Sector in the Years 2002-2010,* p. 24

The question of how the prices of water are determined for the various sectors in the economy, was always a subject that was open to dispute, and has been dealt with in many of the State Comptroller's reports since the 1950s.

The Water Law, that was passed in the Knesset in 1959, lays down rules for calculating the price of water, in these words: "These rules were based on the real costs of the water supplier in connection with the production of water and its supply, including interest, depreciation and other costs".[226]

However, originally the water Law dealt only with water supplied by "Mekorot", and the prices that the local authorities collect in their boundaries - not the water (today around 40%) produced by water associations and those with rights over wells. Regarding this water in 1962 the "equalization fund" was applied.

In August 1971, a committee headed by Gad Ya'acobi published a report that dealt with the examination of the secondary legislation dealing with the price of water in the country, and especially the price of water for agriculture (that at the time constituted 80% of the overall consumption). The Committee recommended that a realistic price for water be fixed, but its conclusions were shelved.[227]

In her special report on the administration of the water sector of December 1990, the State Comptroller dealt with the subject of water prices for agriculture, in a most harsh manner:

> "The low selling price of water for the agricultural sector is, to a large extent, the cause for the constant deterioration in the water sector, and the serious distortion in the agricultural sector. The low price enables the continued existence, and even the continued development of agricultural crops, that not only fail to contribute to the national economy, but cause it significant economic harm, in addition to the damage caused by the over-pumping from the reservoirs... Reducing the price of water for agriculture, requires an apparatus for allocation by means of quotas, which by its very nature is economically inefficient, and creates an artificial demand for increasing the quantity of available water by means of water projects, whose construction is not worth while for the national economy, since it is expected that the cost of the water that they will produce, will be much higher than the return that will be obtained from the crops, that will be irrigated with them. Since one is speaking of planned investments worth hundreds of millions of dollars in the next decade, it is necessary that there should be no gap between the price of water for the farmers, and the cost of water, on the basis of which investment plans for projects designed to increase the quantity of water, are

[226] The Water Law, 1959, article 111

[227] The conclusions of the Ya'acobi Committee appear in the final document and recommendations of the Committee for the Principles of the Water Sector Development Policy, Jerusalem, March 1975, pp. 21-30 (the document was given to the Committee's representative by former Water Commissioner Menachem Kantor).

[228] *Report on the Management of the Water Sector in Israel*, Jerusalem, 1990, pp. 54-55 (Hebrew)

> approved.
> The State Comptroller has commented many times, since the mid seventies, about the economic and budgetary distortions that the provision of a subsidy to water involve. Raising the price of water, especially to the agricultural sector, until it is equal to its real cost, is a vital means to prevent the continuation of the dangerous deterioration of the water sector, and to cure it gradually".[228]

Following the Report, regulations were laid down in 1991, on how to calculate the cost of water. For the first time, these regulations defined what the cost of water is, and enumerated its components.

The cost of water was defined as:

> "The cost of water to the national economy, that includes all the necessary costs, so that it will be possible to use a unit of water, including the production, supply, conveyance and distribution of water costs, expenditures on preventing undesirable environmental effects, and activities for preserving the water sources for the long run, and other charged expenditures enumerated in these regulations".[229]

The regulations defined three groups of variables, according to which the cost is to be determined:

2. (1) (a) The alternative cost of the water source, or the need to develop a new source of water upon the depletion of the existing source, or the completion of its exploitation;
   (b) The cost of the production installation;
   (c) The cost of treating the water, and improving the water;
   (d) The cost of the operative storage of water;
   (e) The cost of supplying the water and conveying it;
   (f) The cost of distributing the water;
   (g) The cost of collecting the remainder of the water, the cost of drainage in the use for agriculture, and the cost of treating the sewage in the non-agricultural usage, all to the extent required in order to preserve the water sources only, and excluding preservation of the quality of the soil;
   (h) The cost of treating the remaining water;
   (i) The cost of removing or reclaiming the remaining water;
   (j) The cost of the means directly or indirectly required to preserve the quality of the water at the water source;
   (2) (a) Investments and capital costs;
   (b) Costs of purchase of water;
   (c) Energy costs;
   (d) Operational costs and wages;
   (e) Maintenance and repair costs;
   (f) Transportation and vehicle costs;

[229] Water Regulations (Calculation of the Cost of Water) 1991, Chapter A article 1

(g) Planning, jurisdiction and supervision of execution costs;

(h) Expenditures on hydrological and environmental observation, inspection of water quality, and improvement of water;

(i) Research, development and data collecting costs;

(j) Expenditures on management, collection, taxation, advisory services, protection, rent, leasing and land, overhead costs, and other general costs.

(3) (a) Increasing efficiency of the production and supply of water;

(b) Credibility requirements for supply on a multi-annual, annual, 24 hour, daily, or other basis;

(c) The overall quantity of water, that must be produced or supplied in an enterprise, in the pressure or cost zone; the requirements for maximal short-term consumption; the periodic or seasonal distribution of the demand for water;

(d) The overall quality of water in an enterprise, the pressure or cost zone, including the demand for the special quality of water, if such exists.

Simultaneously with the introduction of the regulations, the then Water Commissioner, Prof. Dan Zaslavsky, appointed an 18 member committee, headed by Dr. David Mish'li, to deal with the issue of their implementation. The Committee issued a tender "to develop the necessary tools... that will help determine the costs of water in every enterprise in Israel, with the possibility of current up-dating, required due to parametrical changes influence the cost". At a later stage the goal of the work was defined as "to develop a computerized model, that will enable the Water Commission (the Equalization Fund) to examine the reasonability of the water costs presented for its approval. The results of the reasonability test will enable the Equalization Fund to examine with greater detail the costs of the enterprises, in which a detailed examination is required".[230] After several years of work, the Committee presented Water Commissioner, Gideon Tsur, with a thick interim report to, but after the subject of the Equalization Fund was transferred to the Ministry of Finance in 1995, the work of the Committee was actually stopped, since its approach to the subject was not to the Ministry's liking.[231]

In 1999, a production levy was introduced by means of the Adjustments Law.[232] The Adjustments Law added to the Water Law articles 116-124, which stated, *inter alia* that: "A production levy shall be imposed on all water producers from a specific water source, and shall be calculated according to units of the quantity of water produced. The height of the

[230] David Mish'ali, "Comments on 'the model for calculating the costs of producing water in the water enterprises in the country'", *Mayim Vehashkaya*, No. 357, July 1996, p. 41 (Hebrew)

[231] Information supplied by Dr. David Mish`ali to the Committee's representative in a phone conversation on April 11, 2002

[232] The Adjustments Law is a law attached to the Budget Law, and enables various legislative changes required for the implementation of the budget - the translator

levy shall reflect the regional and national shortage of water, and can be different for every source of water, and for every destination of the water and the uses of it".[233] A water producer, on whom a production levy has been imposed, is entitled to collect a sum equal to the production levy imposed on that unit, from his water consumers, together with the return for every unit of water supplied to him.

The problem with all the rules, as they were worded in the law and the regulations, is that they are not necessarily applied by the letter. Even when one is speaking of water produced by "Mekorot", the process of determining the prices of water is awkward, and affected by considerations that are not economical. Despite the fact that some of the paradoxes in the process of determining the prices were canceled,[234] the process remains awkward and inefficient, as the Committee heard from the former Minister for National Infrastructures, Avigdor Lieberman:

> "When I want to raise the price of water for the agricultural sector, or the urban sector, I must first of all pass a resolution in the Government, and after that beg the Minister of Agriculture to sign. The Minister of Agriculture passes it on to the Minister of Finance, the subject returns to the Knesset Finance Committee, and usually the agricultural lobby does not enable anything to be done, and the subject gets stuck for months upon months... Government resolution 2369, that was adopted by the Barak Government, and speaks of raising the price of water by 10 percent, was adopted on September 18, 2000. To the present day the Minister of Agriculture, both in the previous Government and in the current Government, refuses to sign the price rise. We repeated the resolution in a cabinet resolution on April 18, 2001, and again at the meeting of July 1, 2001 in another cabinet resolution, but to the present day the Minister of Agriculture refuses to sign, and I am not entitled to refer the resolution to the Finance Committee...".[235]

As to the production levy, the farmers argue that we are dealing, in fact, with a tax, and not a levy, since the funds collected from a levy are used for a particular purpose, and the levy funds (in those places where they are being collected) simply enter the current budget.[236]

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[233] Article 116 of the Water Law, 1959

[234] For example, in July 1992 the Subcommittee on Water of the Knesset Finance Committee, that had been established in October 1975, was abolished. The Subcommittee, most of whose members were part of the agricultural lobby, had the task of fixing the prices of water for agriculture and towns. After its abolition, a mechanism for updating water prices on the basis of a basket of inputs was introduced, so that today one does not argue about the price, but about changes in the basis of the price. See evidence given to the Committee by former Minister of Agriculture Haim Oron, on August 12, 2001

[235] Evidence given to the Committee by Avigdor Lieberman, on July 26, 2001

[236] Lecture given by Dr. Dan Dvorskin at symposium of the water associations, that took place at Kibbutz Afikim on April 10, 2002

The list of prices of the water prices supplied to the Israeli economy, correct for the date of the publication of the report is as follows:

Regarding the water in cities and local authorities, the price that "Mekorot" collects is NIS 1.68 per Cu.M. The local authorities then proceed to collect from the individual consumer a progressive price that starts at NIS 2.69 for a certain quantity, goes up to NIS 3.90 for an additional quantity, and reaches NIS 5.78 for the top quantity. The difference between what the local authority pays and what it collects is supposed to be used for maintaining and improving the water and sewage systems within its municipal limits, but in fact the authorities consider these funds ordinary income to all effects and purposes.[237] The Committee understands that when the water and sewage associations, whose established was decided by law in 2001, will start to operate, the large gaps between the price paid to "Mekorot" and the price paid by urban consumers, will be closed.
Industry pays today NIS 1.69 per cubic meter, but the price if soon going to go up significantly[238].

As to the price of water for agriculture, today the farmers pay "Mekorot" for ordinary effluents an average price of 52 agoroth per Cu.M. For water from the Shafdan (treated sewage water from the Dan area) the average price is about 68 agoroth per Cu.M. For sweet water the farmers pay 80.8 agoroth for 50 percent of the quotas fixed in 1989, 97.3 agoroth for the next 30 percent of the quotas, and 130.5 agoroth for the remaining 20 percent.[239]

One of the problems resulting from the cheap price of water for agriculture, is the possibility that this water might be used for other purposes. State Comptroller report No. 51b for the year 2000, that dealt with the subject of supervision of the allocation of water quotas for agriculture, pointed out:

> "The Water Commission continued to allocate water for agricultural use to several settlements, including settlements whose population is economically prosperous and agricultural pursuits in them are negligible, if existing at all. This is the case in the settlements in the local councils of: Kfar Shmaryahu, Savyon, Omer and Ramat Hasharon... Today, Savyon has no agricultural area, that is cultivated for agricultural

[237] Evidence given to the Committee by Shimon Tal on July 1, 2001, and by Avigdor Lieberman on July 26, 2001

[238] Evidence given to the Committee by Ya`ir Rot-Levy from the Manufacturers' Association, on July 31, 2001

[239] Comments made to the Committee by Yoram Tamari from the Association of Farmers in Israel, and Yaron Fishman from the Knesset Research and Information Center, on July 17, 2001

purposes".[240]

Following the report, the allocation for Savyon was stopped, but according to the Water Commission, it is impossible to act in other locations, that are still defined as agricultural settlements. The Water Commission claims, that only the Ministry of Agriculture can examine whether water allocated for agricultural purposes is actually used for agricultural purposes, or for other purposes, such as watering lawns.[241]

Regarding the price of water for agriculture there will soon be a fundamental change, following the signing of a document, bearing the title of *A New Agricultural Policy - A Reform in the Prices of Water*, by the representatives of the Ministry of Agriculture and Rural Settlement, and the Budgets Department in the Ministry of Finance on March 27 2002 - a document that was subsequently approved by the Government.[242]

The introduction to the document says:

> "With the intention of bringing about the efficient use of water in the agricultural sector, and preserving the national goals of agriculture, it was decided to introduce a long-term reform, details of which are brought below. Within the framework of the reform, the prices of water for agriculture shall be raised, and production levies shall be imposed, so that there will be a single price and a single production levy for water from a given source of a given quality, for all water purposes and their uses. A budget, at the level of the added income resulting from the higher price of water, with a certain addition, shall be directed to support agriculture, with the purpose of preserving the agricultural areas, to strengthen the participation in financing public products, other supports and investments in agriculture".[243]

According to the proposed reform, the quotas for water will be abolished, and the prices of water for agriculture will be as follows:

Table No. 11: the Increase in the Prices of Water Supplied by "Mekorot" to Agriculture, in NIS

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[240] The State Comptroller, *Annual Report No. 51b and accounts for financial year 1999*, Jerusalem, 2001, p. 764 (Hebrew)

[241] Telephone conversation by the Committee's representative with the director of the Registration and Consumption Division in the Water Commission, Noga Blitz, on May 15, 2002

[242] Government resolution No. 1741 of April 28, 2002

[243] The Ministry of Agriculture and Rural Development, and the Ministry of Finance, *A New Agricultural Policy - A Reform in the Prices of Water*, document signed on March 27, 2002, p. 1 (Hebrew)

Type of Water	Today	2002	2003	2004	2005	2006
Sweet	0.82-1.32	1.22	1.31	1.37	1.43	Equalization to price collected by "Mekorot" from local authorities
Brackish Basic	0.775	0.85	0.92	0.96	1.00	70%of price for sweet water
Shafdan Effluents	O.63-0.70	0.91	0.98	1.03	1.07	75%of price for sweet water
2nd Degree Effluents	0.45-0.58	0.61	0.65	0.68	0.72	50%of price for sweet water

Table No. 1a from the document signed by the representatives of the Ministry of Agriculture and Rural Development and the Ministry of Finance, on March 27, 2002

Table No. 12: the Increase in the Prices of Self-Produced Water , in NIS

Type of Water	Today	2002	2003	2004	2005	2006
Aquifers	0.40-0.43	0.59	0.62	0.66	0.70	0.70
Upper	0	0.40	0.47	0.55	0.60	0.70
Brackish	0	0.15	0.20	0.25	0.30	0.35
Effluents and Floodwater	0	0	0	0	0.15	0.15

Table No. 1b from the document signed by the representatives of the Ministry of Agriculture and Rural Development and the Ministry of Finance, on March 27, 2002

Towards the middle of 2002, is seems as if despite the changes that have taken place in the sphere of water pricing, the basic problems that troubled the State Comptroller in 1959 and in 1990 are still troubling the decision makers today, and there is still no agreement regarding the basis for determining the price of water.

The Committee heard from the Water Commissioner that the price that "Mekorot" collects from the local authorities - NIS 1.68 - is a little above the cost price today. The price which is mentioned in the reform plan regarding the supply and pricing of water for agriculture, initiated by the Minister of Agriculture, is NIS 1.43 as of January 1, 2005.[244]

Former Minister for National Infrastructures, Avigdor Lieberman, argued before the Committee that the price of sweet water will be the price of desalination, in other words NIS

[244] Comments by Yoram Tamari to the committee on November 24, 2001. The reason that the price of water offered to agriculture is lower than Mekorot's cost price, is that the farmers argue that they do not require water at the same quality as the water for urban consumption (for example, they argue that they do not require the filter that is about to be constructed at the Sapir site along the National Carrier). The Committee also heard from the economist Prof. Yo`av Kislev, on August 13, 2001, that when seawater desalination will begin "it is justified that the city inhabitants will pay the full desalination price..." but that he does not expect "that the farmers will pay prices equal to the cost of desalination".

2.50 per cubic meter, that is the marginal price, [245] even though most of the water in Israel will continue to be produced at much lower cost. In the opinion of Prof. Yo`av Kislev, the marginal price after the beginning of the desalination will be much higher - NIS 3 ,50.and this because the price of 2.50 is the price at the exit of the desalination plant, and does not include all the additional costs. [246]

Dr. Sinaia Netanyahu proposes that the prices of water will reflect,

> "Not only the cost of production and transportation, but also the opportunity cost, which is what we call 'the water scarcity rent', that reflects the lack of availability of water used at present, in future periods". [247]

Regarding the question, who should fix the prices of water, the Committee heard from the Deputy Head of the Budgets Department in the Ministry of Finance, Ronen Wolfman, that a statutory authority should be set up that will be the deciding body regarding the costs and prices of water. [248] The representatives of the farmers do not object to this proposal, as long as there will be in the authority suitable representation to their representatives.

The Committee recommends that after the subject of stopping the subsidization of water for agriculture will be finally settled, and towards the introduction of desalinated water into the water sector, a professional statutory committee (that will not be public) will be established, that will hold extensive discussion on the principles for determining the price for the various types of water in the Israeli market in coming years, whether they are produced by "Mekorot", by water associations, or by private persons.

The Committee recommends, that basically the price of water should be fixed on the basis of economic and not administrative criteria, even though it must be decided whether the price of water in all parts of the country, for every category of quality, and for every category of consumer will be the same or differential, and whether the particular state of the water sector at any given moment of time, should influence the prices of water. A decision in principle must also be taken whether the price of water will be fixed on the basis of its average cost of production and transportation, the marginal cost of production, or on some other basis. The

[245] Evidence given to the Committee by Avigdor Lieberman, on September 24, 2001

[246] Lecture by Prof. Yo`av Kislev at the symposium held by the water association at Kibbutz Afikim on April 10 2002. In his survey, Kislev argued that until the National Carrier went into operation, the marginal price of water (in today's price) was around NIS 0.50 , from 1965 to 1995 the marginal price was around NIS 1.20, and today it is between 1.40 and 1.50. In the year 2005 the marginal price will be around NIS 3.50 per Cu.M.

[247] Evidence given to the Committee by Dr. Sinaia Netanyahu, from Ben-Gurion University, on September 24, 2001

[248] Evidence given to the Committee by Ronen Wolfman, on August 8, 2001

Government will have to take decisions on the basis of the recommendations of the Committee that will be set up, and these decisions will be put into the Water Law, within the framework of the amendments that will be introduced.
After the principles for the pricing of water will be set, the professional committee will turn into a body that takes decisions regarding changes in the prices of water, from time to time. The decisions of the Committee on this matter will be final, and not open to appeal.

9.6. The Creation of New Sources of Water

In order to increase the supply of water, there are four practical sources: the desalination of seawater, the desalination of brackish water, the treatment of sewage water, and importation. In theory there are two additional sources, but the ability to realize them is limited, because they are not economically viable, or inefficient: the increase of the quantity of water by seeding clouds, and the catching of floodwaters.

9.6.1. The Desalination of Seawater

Since the establishment of the State, the subject of desalination has enjoyed a good deal of attention, and over the years several small experimental plants, based on various desalination techniques, were set up. Some of these succeeded, and some failed, but until recently none of them proved to be economically viable.[249] Even though it was clear to all the experts, that a day would come when Israel would start to desalinate seawater, for years this remained a vision.

In 1956 the then Prime Minister of Israel, David Ben-Gurion, wrote the following:

> "If our science and technology people will devote their best research, and receive for this purpose all the assistance from the State, it will not be beyond them to find a cheap process for desalinating seawater. Irrigating the desert with purified seawater might seem to many today a delusion, but Israel should be the last state to be afraid of 'delusions', that could change the primal order by force of the power of vision, science, and pioneering capability".[250]

[249] See for example, the State Comptroller, *Annual Report No. 26*, Jerusalem, 1976, pp. 489-90 (Hebrew), that pointed out that despite the great progress in the sphere of know-how regarding various desalination techniques, none had reached a level of economic viability due to the high rate of investment required, and the high cost of the desalinated water

[250] David Ben-Gurion, *Southwards*, Vol. 5, Einath Publishers, 1956, pp. 297-309 (Hebrew)

In 1964 U.S. President Lyndon Johnson, offered, within the framework of his "Water for Peace"policy, to help Israel construct a dual purpose nuclear power station, to generate electricity, and desalinate 200 Million Cu.M of seawater per annum. But very quickly it became apparent that the technology did not yet exist to set up such a plant at reasonable cost. The idea fell for political reasons as well.[251] The only by-product of this project was the construction, in 1983, of an experimental desalination plant in the Ashdod power station, with joint U.S-Israeli financing.[252] The plant was attached to a unit that was planned to close down within a year.

In 1985, when it was finally decided not to implement the "Seas Canal" (Med-Dead) project, that involved the generation of electricity, and seawater desalination as a by-product, the then Minister of Energy and Infrastructure, Moshe Shahal, announced that the project had been rejected as a result of its high price, and the fact that no investors had been found for it.[253]

Following the (1993) Oslo Accords, and the (1994) peace agreement with Jordan, three plans resurfaced for "Seas Canal": one that would connect the Mediterranean, from the Gush Katif area ,and the Dead Sea; one that would connect the Mediterranean, from the Athlit area, and the Jordan River near Beit-She`an; and the third that would connect the Red Sea and the Dead Sea.[254] The new projects, that this time placed the emphasis on desalination, and the generation of electricity as a by-product, spoke of installations for the production of 800-1,000 Million Cu.M (!) of desalinated seawater per annum, at a cost of around 3.5-4 billion dollars. These plans never came up for discussion in the Government of Israel,[255] and were only mentioned briefly in the Knesset by the Minister of Energy and Infrastructure, in the course of a review of the activities of his Ministry in may 1994. From what the Minister said, one may gather that the reason why at this stage the project did not generate any official reaction from Government factors in Israel, was that since the project was to have supplied

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[251] See for example Avner Cohen, *Israel and the Bomb*, Jerusalem and Tel-Aviv, Schocken Publishers, 2000, pp. 276-85 (Hebrew)

[252] A detailed study on the history of desalination in Israel, is being preparation by Dr. Susan Hattis Rolef

[253] Speech by Moshe Shahal, *Knesset Record*, Vol. 103, December 25, 1985, pp. 1005-9 (Hebrew)

[254] Among the persons who were active in pushing these projects were Meir Ben-Meir (who was not Water Commissioner at that time), Shlomo Gur (one of the planners of 'Homa *Umigdal*' in pre-State years, and an active mover of projects after the establishment of the State), and the Military Industry, that was acting in cooperation with a German company

[255] Appearing before the State Control Committee on January 3, 2000, the outgoing Water Commissioner, Meir Ben-Meir related that in 1995 he presented his plan to Minister of Agriculture, Ya'acov Tsur , and was even invited to present it to the then Prime Minister, Yitzhak Rabin, "and I say, in the words once used by Golda (Meir), that the plan was not rejected, because it simply wasn't discussed. No one said that it was no good - simply, no one bothered to look at it"

water to the Jordanians and Palestinians as well, the financing was supposed to be external, and the European Community was going to allocate resources to check it out.[256]
We do not have the results of the European examination, but unofficial Israeli factors, who tried to evaluate the cost effectiveness of the various projects, compared with plans for the construction of desalination plants along the Mediterranean coast, reached the conclusion, that at least at this stage, there was no economic justification to execute them.[257] Speaking of the three plans, the President of Beersheba University, Prof. Avishay Braverman, said that the Committee he had headed to prepare a report on the water sector in Israel for the World Bank,[258] recommended that the economic viability of the plans be examined, but "no one was interested". The Report itself stated, that towards the year 2005 a serious water shortage was to be expected, and therefore it would be necessary to start desalination in 2000.[259]

The Committee heard a lot of evidence regarding desalination plans that came up in these years, and were not given any attention, or were rejected. Thus, the Water Commissioner in the years 1981-91, Zemah Yishai, reported that when he was Water Commission, he had presented to the Ministry of Finance a plan for desalinating 35 Million Cu.M of seawater and brackish water at a price of 90 cents per Cu.M[260], but the plan did not receive any attention.
Prof. Dan Zaslavsky, who was Water Commissioner in the years 1991-92, related that in 1991, during a discussion in which he participated with Prime Minister Yitzhak Shamir, and Minister of Defense Moshe Arens, an explicit decision was taken to desalinate 80 Million Cu.M of water. Following the decision, Zaslavsky hired the services of a private company, to start planning the desalination plant, but, according to him, when he presented the project to the new government that was set up in May 1992, Deputy Prime Minister Shimon Peres announced that he objected to it.[261]
A similar fate befell the recommendations of a committee for water desalination, that was set up in the Knesset by the Finance Committee in October 1991, and was headed by Knesset Member Gershon Shafat. The Committee, that presented its conclusions in March 1992,

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[256] Speech by Moshe Shahal, *Knesset Record,* Vol. 137, May 17, 1994, pp. 7223 (Hebrew)

[257] See for example, Danny Freeman, *The Seas Canal*, position paper No. 3, Jerusalem, the Ministry for Economics and Planning, the National and Economic Planning Authority, May 1995 (Hebrew)

[258] *Israel Water Study for the World Bank*, Ben-Gurion University of the Negev in cooperation with Tahal Consulting Engineers Ltd. August 1994

[259] Evidence given to the Committee by Prof. Avishay Braverman, on July 30, 2001

[260] Evidence given to the Committee by Zemah Yishai, on July 9, 2001

[261] Evidence given to the Committee by Prof. Dan Zaslavsky, on July 15, 2001

recommended that seven desalination plants be constructed, each with a production capacity of 45-50 Million Cu.M per annum, with the participation business factors and "Mekorot", that would contend in international tenders. The Committee suggested that the first plant for water desalination should be constructed in the Gaza Strip, or on the border of the Strip.[262]

It should be remembered that Zaslavsky's plan, and that of the Desalination Committee, were presented after the "flood" of the winter of 1991/92, and the whole issue of desalination was simply removed temporarily from the agenda. However, according to Zaslavsky, there were political reasons for the rejection of his plan by the Deputy Prime Minister and Foreign Minister, while Shafat argued that opposition to desalination did not only result from the full reservoirs, but from the opposition of the urban sector, and the fact that "Mekorot" objected to the issuing of international tenders. According to the former Director General of the Ministry of Agriculture, Danny Kritchman, there was in this period opposition in principle to desalination in the Ministry of Finance, for economic reasons, and on the side of the farmers, who were afraid that finally desalination would raise the prices of water for agriculture as well, even though agriculture was not supposed to use desalinated water.[263]

The Arlozoroff Report, that was published in the beginning of 1997, still spoke of delaying the desalination of seawater until 2010, or later (see paragraph 7.3.5.), and argued that before one started to desalinate seawater, one should take various steps to make the water sector more efficient, such as cancellation of the water quotas, and fixing a real price for water in agriculture, treatment of sewage water, desalination of brackish water, etc. It seems as though Gideon Tsur, who as Water Commissioner in the period when the Arlozoroff Committee was set up, also believed that desalination would be the "last resort" solution, after all the other possibilities had been exhausted.[264]

However, in March 1999, following the deteriorating water situation due to the drought, and two months before the general elections, a first ever resolution was adopted by the outgoing Government - to start and prepare in a practical manner for the desalination of seawater, including the preparation of tender documents.[265] It was the Minister of Finance in the new

[262] Evidence given to the Committee by former MK Gershon Shafat, on July 19, 2001

[263] Evidence given to the Committee by Danny Kritchman, on July 19, 2001

[264] Gideon Tsur, "Seawater Desalination as a Last Resort", in *Water and Irrigation Review*, vol 16, No. 1 1996, pp. 12-13 (English)

[265] Government resolution No. 4895 of March 7, 1999

Government, Avraham Beiga Shohat, who after passing a resolution in the Government on the subject,[266] instructed the officials in his Ministry, who were not in the least enthusiastic about the idea,[267] to start preparing a tender for the construction of a plant for the desalination of 50 Million Cu.M of seawater per annum, under the BOT (build, operate, transfer) method, so that the decision makers would finally have exact figures regarding the cost of desalinated water. In his evidence before the Committee, Shohat stated, that among the arguments against the beginning of desalination was the fear that if Israel would start of desalinate large quantities of water, it would be required to give up larger quantities of underground water (in other words, water from the Mountain Aquifer) to the Palestinians, but that he had reached the conclusion, that despite everything, Israel should start the experiment in a limited way.[268]

The first tender for a plant, to be built under the BOT method, was published on July 25, 2000.[269] In September 2001 the surprising price offered in the first tender was made known - 52.69 cents per Cu.M , after it was not expected that the price would go below 60 cents. Since there was a delay regarding the importation of water from Turkey (See paragraph 9.6.4.), the Ministry of Finance announced that the installation in Ashkelon would be with a production capacity of 100 Million Cu.M per annum. A series of tenders for desalination plants with a total production capacity of 65 Million Cu.M, that will be built under the BOO (build, operate, own) method, was issued in May 2001, and the Tenders Committee is currently at the stage of examining the offers.

In April 2001, the Ministerial Committee for Social and Economic Affairs, decided, contrary to the opinion of the officials at the Ministry of Finance, to enable "Mekorot" to construct a desalination plant with a production capacity of 45 Million Cu.M, close to the power station in Ashdod, under the Turn Key method - in other words, “Mekorot” will built the plant, but

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[266] Government resolution No. 2117 (EC/46), of August 3, 2000

[267] In his evidence to the Committee on July 24, 2001, David Milgrom, who had served as head of the Budgets Department while Shohat served as Minister of Finance, said that there was opposition to start acting towards the construction of desalination plants. “We in the Budgets Department”, he said, “believed that this decision, in accordance with the recommendations of the Arlozoroff Committee, should be implemented only after the other measures... There was fear, that all the measures that everyone was speaking about - effluents, the desalination of brackish water - would lie in the drawers, and what would happen, I said to the Minister of Finance, was that every week someone would come to you with another module and another module for additional desalination...”

[268] Evidence given to the Committee by Avraham Beiga Shohat, on July 24, 2001

[269] The Deputy Accountant General in the Ministry of Finance, Yuval Bronstein, explained to the Committee, when he appeared before it on August 1, 2001, that it was impossible to issue BOT tenders faster, both because of the size of the project, and because it was the first of its kind. “The major problem in such tenders”, he explained, “is the distribution of risks... I think that the process of a tender of such dimensions in such a short period, is a success. There are laws, regulations and the obligation to hold tenders in the State of Israel - we did not find a way to circumvent the law”.

will not operate it.[270] "Mekorot" has issued a tender for the construction of the plant, and in February 2002 the offers were received. Only recently were differences of opinion between the Ministry of Finance and "Mekorot" settled, regarding the issuing of a tender for the operation of the plant, after its construction is completed, with "Mekorot" announcing its intention to run the installation for one year before passing it on to an operator, and the Ministry of Finance argued that "Mekorot" must issue a tender for the installation's operation immediately. Under heavy pressure from the Ministry for National Infrastructures and the Prime Minister's Office, the Finance Ministry was convinced to give in.[271]
Currently, the Accountant General's Department in the Ministry of Finance and the Planning Division in the Water Commission, are working on a feasibility study for a BOT tender for an additional desalination plant, that will be set up in the compound of the power station at Hadera, with a production capacity of 100 Million Cu.M.

According to a draft of the Water Commissioner's Master Plan, as published in January 2002, the intention was to double the production capacity of the small intallations, and add large desalination plants with a total production capacity of 120 million Cu.M., at a rate of 50 Million Cu.M every two and a half years , by 2010. The intention is to reach a total production capacity of 495 Million Cu.M of desalinated water.[272]

In the plan as published in April, specific projects are mentioned with a production capacity of 400 Million Cu.M, after the Ministerial Committee for Social and Economic Affairs had decided, on March 20, 2002, to increase the desalination capacity to 400 Million Cu.M - 200 Million Cu.M more than in the previous Government resolution. This decision was approved in Government resolution of April 4, 2002. It should be noted that the Water Commission's plan, and the plan in the Government resolution are not identical in their details.

Table No. 13: Projects that are on the Agenda, According to the Water Commission's Master Plan, and the Government Resolution of April 4, 2002

Name of Project	Status	Executor	Description of Project	Planned Production

[270] Evidence given to the Committee by "Mekorot" Director General Amos Epstein, on August 10, 2001

[271] An argument on the issue took place between a representative of "Mekorot" and a representative of the Ministry of Finance, at a meeting of the Committee that took place on January 21, 2002. *Ha`aretz* reporter Amiran Cohen, followed this ongoing argument, and reported on the agreement between the Ministry of Finance and "Mekorot" in an article on April 4, 2002

[272] The Ministry for National Infrastructures, and the Planning Division in the Water Commission, *Master Plan (transition) for the Development of the Water Sector in the Years 2002-2010*, Interim Report - Stage A, January 2002, p. 43

				Capacity in Millions of Cu.M	
Ashkelon desalination plant	Contract signed - construction has begun	Private	Seawater desalination at Eilat-Ashkelon Pipeline site - BOT method project	100	100
Desalination plant in Western Galilee	Preparation of tender	Private	One of the BOO projects	60	0
Ashdod/Palmahim desalination plant	Preparation of tender	Private	"	55	0
Small desalination plants	Choosing winners in tender	Private	"	0	65
Hadera desalination plant	Feasibility study	Private	Seawater desalination at Electricity Corporation site and Caesarea Development Company site - BOT project	50	100
Shafdan desalination plant	"	Private	Installation in area of Shaftan enterprise, for Gush Dan area	90	0
Ashdod desalination	Preparation of tender	"Mekorot"	Seawater desalination at Ashdod power station site - Turn-Key project	45	45
Additional plants	Examination by D.G. of Ministry for National Infra-structures and Accountant General of Finance Ministry*			0	90
Total				**400**	**400**

Based on Table No. 15, Minister for National Infrastructures and Planning Division of the Water Commission, *Master Plan (transition) for the Development of the Water Sector in the Years 2002-2010*, Final Report, April 2002, p. 58, and Government resolution No. 1682 (SE/32) of April 4, 2002. Water Commission figures appear in blue and Government figures in green

* Additional sites being examined for installations are, apparently, Giv'at Olga, Ashkelon, and Haifa Bay[273]

The Committee welcomes the fact that the first tenders for the construction of seawater desalination plants are on their way. The Committee hopes that the experience that will accumulate from the construction of installations based on different types of contract (BOT, BOO and Turn-Key) will enable the State to decide which method is preferable for the construction of additional installations, to shorten the process of issuing and examining the tenders, and reduce in future the involvement of the Ministry of Finance in the process, to the necessary minimum.

The Committee congratulates the Government on its resolution of April 4, 2002, in which it approved desalination installations with a capacity of 400 Million Cu.M per annum, by 2005, and supports the plan, prepared by the Planning Division of the Water Commission, which calls for a desalination capacity of close to 500 Million Cu.M by 2010. The Committee is worried by the fact, that after the approval of the plan, it might become apparent, that there

[273] Report by Amiram Cohen, *Ha`aretz*, March 21, 2002

isn't a sufficient operational capacity to keep up with the determined tempo, and recommends that a special effort be made to increase the operational capacity of the public and private bodies operating in the water sector.
The committee also considers vigorous activity to be of supreme importance. This will ensure that the pipeline and infrastructures for recharging the aquifers, that must accompany the construction of the desalination plants, will be planned and laid in time. This activity must be executed primarily by "Mekorot", and every effort should be made to finally liquidate the state of crisis that it is in.

9.6.2. The Desalination of Brackish Water

Part of the ground water in different areas in Israel, is brackish water at various levels of salinity. There are limited spheres in which one may use such water without treatment. Thus, for example, one can irrigate dates and almonds with it.[274] The tomatoes grown in Nizana are also irrigated with brackish water. Brackish water can also be used for certain operations in industry.[275]

The desalination of ground water is much cheaper than the desalination of seawater, and those who sought in the past to put off the beginning of the latter argued, that before one starts producing expensive water, it is preferable first to exhaust the treatment of sewage water, and the desalination of brackish water.[276] *Inter alia*, this also was the position of the State Comptroller, in her special report of 1990, and of the Arlozoroff Report, that actually accepted the position of the Ministry of Finance on the subject. One of the reasons for the cheaper price of desalinating brackish water is the much smaller consumption of electricity required, than in the case of the desalination of seawater. While a seawater desalination plant consumes 4-4.5 kilowatt/hour per Cu.M, a brackish water desalination plant consumes only 1-1.5 kilowatt/hour.[277]

[274] Evidence given to the Committee by Uri Dorman, chairman of the Fruit Council, on September 10, 2001

[275] Comments made to the Committee by Erez Yamini, on July 31, 2001

[276] Evidence given to the Committee by David Milgrom, former head of the Budgets Department in the Ministry of Finance, on July 24, 2001

[277] Evidence given to the Committee by Menahem Priel, Director of the Desalination Unit in "Mekorot", on January 21, 2002

In Eilat “Mekorot” started desalinating brackish water already in the 1960s, and only in 1997 did seawater desalination begin. Today, out of around 12.5 Million Cu.M of water desalinated in Eilat, around 70% are desalinated from brackish water and 30% from seawater.[278] In 1983 “Mekorot” presented a plan for the desalination of 70 Million Cu.M of brackish water in various locations, but in fact installations for the desalination of only 4.5 million were constructed. A five year plan for 1995-2000, presented in 1994, recommended the desalination of around 30 Million Cu.M, but of this only a capacity of 9,000 Cu.M was constructed. In the same plan it was proposed to construct a large plant near the Sea of Galilee, that would desalinate spring water at a rate of around 14 Million Cu.M per annum, but the installation hasn't been constructed to the present day.[279]

The Water Commission's new Master Plan speaks of the possibility, that by 2010 222 Million Cu.M of brackish water per annum will be desalinated, of which 150 Million Cu.M would be within the tri-basin system (i.e. the area of the Sea of Galilee, the Coastal Aquifer and the Mountain Aquifer - the translator) and the rest outside of it. This quantity constitutes an addition of around 102 Million Cu.M to what is currently being desalinated.[280]

As in the case of the desalination of seawater, so there is also some disagreement regarding the participation of “Mekorot” in the desalination of brackish water. The Ministry of Finance, that objected in principle to the entry of “Mekorot” into seawater desalination, does not object in principle to its participation in the case of brackish water, side by side with business factors, and in August 2000 “Mekorot” received permission to construct several small installations, *Inter alia* for the hotels at Ein Zohar, in Nizana and for the IDF in Bik'at Sayarim.[281] According to the Master Plan, out of NIS 885 million that are to be invested in new installations for the desalination of brackish water, 708 will be invested by "Mekorot" and the rest by private entrepreneurs.[282]

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[278] Comments made by Rafi Ifargan, Director of the Water Supply Unit in the Arava, during the Committee's tour at the “Mekorot” installations in Eilat on December 9, 2001

[279] Comments made by Menahem Priel during the Committee's tour at the "Mekorot" installations in Eilat on Decmeber 9, 2001

[280] The Ministry for National Infrastructures - the Water Commission, *Master Plan (transition) for the Development of the Water Sector in the Years 2002-2010*, Final Report, April 2002, pp. 62 and 64

[281] Comments made by Erez Yamini to the Committee on January 21, 2001

[282] See table No. 10

Several witnesses told the Committee about vast quantities of brackish water that are to be found at great depth under theNegev. Prof. Arie Issar, is the main proponent of extending the research concerning this water, with the goal of utilizing it,[283] but all the other witnesses who related to this water argued that except for small quantities, in areas where no other water exists, this water is too deep, to saline and too hot for it to be worth while to deal with it.

The Committee supports all the plans for desalinating brackish water, in all those areas where it is worth doing so from an economic point of view - in other words, the price of drilling the water and desalinating it is worth while, and there is use for this water in the area where it is found, or it can easily be connected to the national pipeline system.

9.6.3. Sewage Treatment - Effluents

The problem regarding sewage treatment, results from the fact that one must ensure that, on the one hand, the sewage does not endanger the public's health, or damage the environment, and on the other hand, the treated water can be used for irrigation purposes and industry. The subject of sewage treatment, has been on the national agenda since the establishment of the State, but received a push after the outbreak of a cholera epidemic in Jerusalem and Gaza in 1970, when Minister of Finance Pinhas Sapir decided to approach the World Bank for assistance in carrying out wide-scale projects.[284]
In terms of the crisis in the water sector, the issue is of supreme importance, because the plan is that agriculture should use a growing amount of effluents - in other words, treated sewage - and thus "release" sweet water for other uses.

Today there are in Israel two major projects for reclamation: the Kishon complex project, that treats the effluents of the Greater Haifa area, that are used primarily for irrigation in the Western Esdraelon Valley, and the project for reclaiming the Dan area effluents - the Shafdan and the “third line” - that is perhaps the most sophisticated of its kind in the world, and supplies approximately 120 Million Cu.M of high quality water for agriculture in the South and the Negev, with a high level of credibility.[285]

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[283] Evidence given to the Committee by Prof. Arie Issar, on July 30, 2001

[284] Evidence given to the Committee by Prof. Gedalia Shelef, from the Technion, on November 25, 2001. Shelef quoted Sapir as saying: “I do not want Cholera!”

[285] Ibid.

It is agreement among experts that around 70% of the water consumed in urban settlements, return in the form of sewage, and of this, after treatment, 80-85% remain as effluents. In other words, between 55% and 60% of the quantity of water consumed in urban settlements can be reclaimed as effluents.

The basic sewage treatment takes place in Israel in around 600 sewage treatment plants, of which 360 are oxygenation pools in Kibbutzim, Moshavim etc. Only in two cities - Acre and Nahariya - the sewage treatment system is not complete.[286]

The problem is the addition of third degree treatment, or additional treatment, beyond what is needed for basic health and environmental reasons, so that it will be possible to use the water in agriculture, or for other uses. There is an argument whether this should be done by the local authorities at their expense, or at the expense of the State, that is the owner of this water. In his evidence to the Committee, Prof. Gedalia Shelef argued that it is not worth while for the State to be right in this argument, but wise, and the only way to get the local authorities to perform third degree treatment, is to give them incentives to do so. He added that the price for first and second degree treatment of sewage is between 20 and 30 cents per Cu.M, and third degree treatment adds another 12 cents.[287]

An additional debate is being carried out regarding the level of purification that should be attained so that not only will the agricultural crops being irrigated with the treated water be edible, but also that the soil into which the water seeps, should not be salinated.[288] It seem as though there is agreement, that unless the intention is to pour the water into the sea, the water must go through third degree treatment, at least, like the water of the Shafdan, but there are those who argue that it should also be desalinated as well, in order to clean it of salts.[289]

Two years ago, following a decision of the Ministerial Committee for Economics, a special committee, headed by Dr. Yossi Inbar from the Ministry for the Environment, was set up, whose goal was to prepare legislation on the issue of the quality of effluents, that will enable

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[286] Ibid.

[287] Ibid.

[288] See, for example, *Report of the Committee on Irrigation with Effluents in Agriculture*, the Committee for Inferior Water by the Water Commission, May 1999 (the Report of the late Prof. Dan Yaron), and the evidence given by the former Director General of the Ministry of Agriculture, Danny Kritchman to the Committee on July 19, 2001

[289] Evidence given to the Committee by Prof. Dan Zaslavsky, on July 15, 2001

the use of this water in agriculture, without causing damage. The Special Committee has already presented its proposals to the Government.[290]

The Committee heard that there is still raw sewage running down valleys in the country, and/or flowing into the sea, and that some of the water flowing into the sea is water that has been treated to the second degree. The exact quantity of this water is not clear, and the Committee received contradictory data on this issue.[291] The reasons why treated water flows into the sea, is that there are treatment plants in various towns that are not connected to a pipeline system that can convey the water to agricultural areas, there isn't demand for effluents in all parts of the country, and in water that has gone through secondary treatment, there remain various materials that are harmful to agriculture, such as boron, and then the only logical solution is to pour it into the sea.[292] The Director General of "Mekorot" argued before the Committee that in 2008, there will be a surplus of effluents in Israel.[293]

Regarding the need to extend the purification system and improve it, the Committee heard that in 1998 the Ministry of Finance decided to use funds that had accumulated in the Equalization Fund[294] as grants, at a level of at least 40%, for the development of projects for the reclamation of sewage water by private entrepreneurs, water associations, local and regional councils, or municipalities. The Ministry was supposed to allocate NIS 80 million per annum every year, over 10 years, starting in 1999, but so far very little use has been made of these funds, both for reasons of slow organization by those who are supposed to implement the projects, and for bureaucratic reasons. However, according to the spokesperson of the Water Commission, in the last year the Ministry of Finance has approved grants at a rate of 60% of the investment, plus loans, or joint projects with the Jewish National Fund, for 12 sewage reclamation projects.[295]

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[290] Evidence given to the Committee by Ramy Koren, Director for agricultural Research at the Institute for Soil, Water and Environment Sciences at Beit Dagan, on July 30, 2001

[291] For example, while giving evidence to the Committee on July 27, 2001, Minister for National Infrastructures, Avigdor Lieberman, gave the figure of around 70 Million Cu.M of treated sewage water that flows into the sea. In his evidence to the Committee on August 12, 2001, Prof. Avner Adin gave a figure of around 200 Million Cu.M of sewage water and treated sewage water

[292] Interview with Dr. Eran Feitelson with the Committee's representative, held on February 26, 2002

[293] Comments made by Amos Epstein during the Committee's visit to the "" installations in Eilat, on December 9, 2001

[294] Until 1999 NIS million had accumulated in this fund

[295] Evidence given to the Committee by Ya'el Shoham, on July 17, 2001

According to a representative of the Budgets Department in the Ministry of Finance, the cost of the new projects reaches NIS 230 million, but there is still an organizational problem, that is delaying the implementation.[296]

Two former Ministers of Agriculture, that appeared before the Committee – Ya'acov Tsur and Haim Oron - told the Committee that they support the execution of the effluents projects under the BOT method, as had been done in the case of the desalination of seawater, but the State must undertake to purchase the water.[297] Former Minister for National Infrastructures, Avigdor Lieberman, actually supports "Mekorot" performing the job, since according to him "as far as entrepreneurship goes, the farmers are apparently incapable of getting organized and offering a solution".[298]

A well known project, known as the "Eastern Conduit", that was supposed to convey effluents from the Center of the country to its South, has for the time being been frozen, for various reasons. One of the explanations given to the Committee was that there is need for effluents four to five months a year, and therefore it is necessary to collect the water in reservoirs during the rest of the time. Since land in the Center of the country, where most of the effluents are manufactured, is expensive, the reservoirs must be created in the South.[299] A fascinating analysis of the debate between those who advocate the conveyance of effluents Southwards, and those opposed to it, which is included in a document presented to the Committee by Dr. Yossi Dreizin, explains that on the subject of conveying the effluents, what is lacking is a body that will decide between the two schools. The conclusion reached by those who wrote the document is that "in fact, there is no agreed national plan regarding the distribution of effluents in the country, and today the conveyance of effluents is more a function of local initiatives, without an examination of the effect of the way in which the issue is treated, on the future face of the State of Israel".[300] (See also paragraph 8.7.2.)

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[296] Comments made to the Committee by Erez Yamini, on January 21, 2002

[297] Evidence given to the Committee by Ya'acov Tsur and Haim Oron, on August 12, 2001

[298] Evidence given to the Committee by Avigdor Lieberman, on September 24, 2001

[299] Evidence given the Committee by Amos Epstein, on August 1, 2001

[300] Dalia Harel, Dr. Joseph Dreizin and Natan Meir, *Water as a National Resource - an Integrative Approach*, Tel-Aviv, December 1999, pp. 33-35 (Hebrew)

Regarding the quantity of effluents that are in use in agriculture today, the Committee heard from one source that the figure is 260 Million Cu.M[301] and from another source it heard that the figure is 270-280 Million Cu.M,[302] with the total quantity of water being treated reaching 380-390 Million Cu.M.[303]

According to a calculation of the reuse potential, based on 70%, it is possible to reclaim an additional 340 Million Cu.M.[304] According to the planning of the Water Commission, by the year 2010 agriculture will get 446 Million Cu.M of effluents, and an additional 63 Million Cu.M will be supplied for other purposes, as follows:

Table No. 14: The use of Effluents in MILLION CU.M, According to the Water Commission's Master Plan

Purpose/Year	**2002**	**2005**	**2010**
Agriculture	295	385	496
Industry	0.2	5	0.2
Total	**295**	**390**	**509**

Table No. 11, *Master Plan (transition) for the Development of the Water Sector in the Years 2002-2010*, Final Report, April 2002, p. 36

The Committee considers that there is an urgent need for the comprehensive treatment of the issue of sewage water reclamation, the construction and operation of a system that will convey the effluents to regions where they can be used, or gathered in reservoirs, and bringing about the installation of regulations to deal with its quality. As with other issues in the sphere of the water sector, the Committee was impressed that what is lacking in is not know-how, but one central body, that will adopt the necessary decisions, and implement them quickly and efficiently, and a clear decision regarding the distribution of execution between "Mekorot" and private factors.

[301] Evidence given by Prof. Gedalia Shelef

[302] Evidence given to the Committee by Noga Blitz, on July 17, 2001

[303] Evidence given to the Committee by Dr. Amos Haddasfrom the Institute for Soil, Water and Environment Sciences, at Beit Dagan, on August 8, 2001

[304] Evidence given to the Committee by Yoram Tamari, on July 17, 2001

9.6.4. Importing Water from Turkey

Over the years various ideas came up regarding the importation of water from abroad, the most serious of which involved the importation of water from Turkey.[305] According to the evidence given by former Water Commissioner, Zemah Yishai, already in 1989 there were negotiations with the Turks on the importation of water, at a price of 21 cents per Cu.M, including transportation. According to him the negotiations failed, because a day after the sides concluded the deal, "the Ambassadors of Saudi Arabia and Jordan, turned up, and said to the Turks that Turkey is acting against the interests of the peoples of the Middle East".[306] It is not clear whether the idea was to bring the water by means of the "peace pipeline", that Turkey was planning to lay at the time, and that was supposed to transport water to all the nations of the regions, by means of large plastic containers, to be pulled by tug-boats, or by means of tankers,[307] but today it appears as though the price mentioned by Yishai was unrealistic.

The decision to issue a tender for the transportation of water from Turkey was adopted by the Government, upon the recommendation of Minister of Finance Avraham Beiga Shohat, in August 2000,[308] so that it would be possible to examine the profitability of the project.[309] The Committee heard from the representative of the Accountant General's Department in the Ministry of Finance about the process of the tender, issued in June 2001 for the transportation of water from Manavgat in Turkey to the Ashkelon-Eilat Pipeline terminal in Ashkelon.[310] The tender spoke of the transportation of 45-50 Million Cu.M per annum, in single-hulled oil tankers, that would be converted to carry water, after going through a process of cleaning, that

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[305] In his evidence to the Committee, given on July 30, 2001, Elisha Kali described the idea of importing water from the Nile in Egypt - a plan which, according to him, had been supported by President Sadat - and from the Lebanon. However, his conclusion was that "the importation of water, which could have been done cheaply, from Egypt and Lebanon, is not realistic, for reasons of national policy and position, and the only source that remained in the region is really Turkey"

[306] Evidence given to the Committee by Zemah Yishai, on July 9, 2001

[307] On the subject of the export of water from Turkey to various countries in the Middle East see: G.N. Gruen, "Turkish Waters: Source of Regional Conflict or Catalyst for Peace?", in Shimshon Belkin and Shoshana Gabbay eds. *Environmental Challenges*, the Netherlands, Kluwer Academic Publishers, 2000, pp. 565-79

[308] Government resolution No. 2117 (EC/46) of August 3, 2000

[309] Evidence given to the Committee by Avraham Beiga Shohat, on July 24, 2001

[310] Evidence given to the Committee by Yuval Bronstein, on August 1, 2001

will ensure that the water reaching Israel will be of a quality that corresponds with the Israeli standards.

Several of the witnesses, who appeared before the Committee, spoke strongly against the project, their arguments being that Israel should not become dependent on a country like Turkey in an important subject like water,[311] that the project is not practical, because it is impossible to ensure that the tankers will be cleaned to the level required, and that it is not profitable.[312]

Opposite the arguments against the importation of water from Turkey, there are two main arguments in favor of the importation, even at a price that is higher than the desalination price. The one, supported by the Water Commission, is that one can start importing water much faster than one can start desalinating - it will take half a year to clean the tankers, and a year to a year and a half to construct a new mono-buoy at the Ashkelon-Eilat pipeline terminal in Ashkelon, and lay down a pipe between it and the Zohar reservoir, with the money for the execution of the work already budgeted by the Ministry of Finance. The second, supported by the Ministry of Defense and Ministry for Foreign Affairs, is that there is vast political and psychological importance to reaching an agreement with the Turks, because they purchase goods and services in Israel, at a value of hundreds of millions of dollars and more.[313]

As to the arguments of those opposed, the argument regarding the creation of a dependence, does not stand the test of reality, because we are speaking of at most 2-2.5% of the water consumption in Israel, and an undertaking by Israel for a period of 5-10 years. Regarding the ability to clean the tankers to the required level, most of the shipping companies that were interested in the tender, and examined the issue, and academicians who are experts in the sphere, are confident that this is possible. Regarding the profitability of importing the water, in light of the low desalination price that was received in the first desalination tender, there is no doubt that the imported water will be more expensive.

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[311] Evidence given to the Committee by Prof. Avner Adin, on July 19, 2001

[312] Evidence given to the Committee by Brigadier General (res.) Emanuel Sackel, on July 19, 2001

[313] See Sheila Hattis Rolef, background document on "The Project for Importing Water from Turkey", Jerusalem, the Research and Information Center of the Knesset, July 30, 2001 (Hebrew), and an article by Amnon Barzilai about the connections between the importation of water from Turkey and military deals of the Ministry of Defense with it, *Ha`aretz*. February 6, 2002

Two groups participated in the tender, but on November 27, 2001, the Accountant General's Department announced that neither of the two had complied with the conditions of the tender, and the tender was cancelled. The cancellation caused great displeasure to the Water Commission, the Ministry for Foreign Affairs and the Ministry of Defense, and to great tension between Turkey and Israel.[314] Immediately talks began to find a solution to the crisis. The solutions offered: the issuing of a new tender; an agreement with Turkey, that it should be responsible for the transportation of water to Israel; the laying of a pipeline in the Mediterranean to convey the water; choosing a shipping company to transport the water in converted tankers or plastic containers, without a tender.[315]

The subject of the importation of water from Turkey, is a clear example of the problematics of decision making in the Government in general, and regarding the topic of water in particular. The main actor in the issuing of the tender was the Accountant General's Department in the Ministry of Finance, that acted properly regarding the conservation of Israel's economic interests, and the minimization of the risks taken, but the officials in both the Accountant General's Department and the Budgets Department did not conceal their displeasure with the project. It was only after a year had gone by, and the importation of water from Turkey seemed farther away than ever, that the Prime Minister was convinced by the Water Commissioner, the Ministry of Defense, and the Ministry for Foreign Affairs, to pass a decision in the Ministerial Committee for Social and Economic Affairs, to import 50-100 million Cu.M per annum from Turkey, in a manner to be decided by a team of Director Generals from various Ministries, headed by the Director General of the Prime Minister's office.[316] This resolution turned into Government resolution No. 1682 (ES/32) of April 4, 2002.

Since the Government's decision regarding the importation of water from Turkey, was based primarily on motives having to do with Israel's foreign relations, and only to a limited extent on its water requirements, the Committee decided to avoid expressing an explicit position on the issue.

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[314] Report by Amiram Cohen, *Ha`aretz*, November 28, 2001

[315] Reports by Amiram Cohen, *Ha`aretz*, February 10 2002, and April 22, 2002, and a Government resolution of March 20, 2002

[316] Regarding the resolution of the Ministerial Committee for Social and Economic Affairs, adopted on March 20, 2002, see Amiram Cohen, *Ha`aretz*, March 21, 2002

9.7 Water Reservoirs

Theoretically there are two types of reservoir: natural reservoirs, such as the Sea of Galilee and the aquifers, and artificial reservoirs, which are reservoirs for catching additional water, and for holding new water (in other words, effluents, desalinated water, and imported water) for the dry seasons.
Former Water Commissioner, Meir Ben-Meir, speaking of the various reservoirs in Israel, gave the Committee the following data:

> "Our total volume for holding water in reserve, in order to bridge over the climatic movements, is around 2.5 billion Cu.M. In other words, if the annual consumption is more or less 1.8 billion, the volume for holding the reserve does not hold even one and a half years".[317]

While presenting the Master Plan, the head of the Planning Division in the Water Commission, Dr. Yossi Dreizin, gave a more pessimistic figure regarding the natural reserve. According to him, in the first stage one must rehabilitate the reserve to 1,500 million Cu.M - in other words, today the reserve contains less than a year's consumption.
Dreizin spoke about the rehabilitation of the natural reserve, while relating to proposals to move the center of gravity of the regulation of the Israeli water system, from the natural system to a system of artificial reservoirs.

> "We do not feel that *á priori* we should do the regulation at some installations that will serve as a backup, and that will be operated, or will not be operated. There is no economic sense to this. When one has a natural reserve, one can use it. It is a multi-annual reserve, and should be preserved as such. This is the reasons that it must be rehabilitated, because there are also those who come and say: 'drop it, the Coastal Aquifer is finished, the Mountain Aquifer will be taken away from us, and the Sea of Galilee also no longer serves as a multi-annual reserve. Construct a system backed up exclusively by the artificial systems. This matter is unacceptable to us!".[318]

[317] Evidence given to the Committee by Meir Ben-Meir, on August 13, 2001

[318] Comments made by Dr. Yossi Dreizin at the symposium organized by the Water Commission on the subject of the Master Plan for the development of the water sector, that took place at the agricultural compound in Beit Dagan on January 30, 2002

9.7.1. The Natural Reservoirs

It has already been stated above (See chapter 5), that the main manifestation of the water crisis is the decline in the water level in the natural reservoirs, to below the red lines, and the resulting decline in the quality of water in these reservoirs.[319]

The Coastal Aquifer

The Coastal Aquifer is the first natural reservoir, from which over-pumping took place. At the end of his term as Water Commissioner, Meir Ben-Meir explained the background to this:

> "When the development of the agricultural settlement enterprise in the South of the country began, the system did not yet have the National Carrier. The Government had two alternatives: the one was to put off the settlement enterprise until after the National Carrier was completed (it was completed in 1964), and the second, to take advantage of the one-time reserve along the Mediterranean, by means of over-pumping from the Coastal Aquifer - to take advantage of the one-time reserve, which would be permanently replaced by the penetration of seawater. In other words, the Government did not fob off the decision between destroying a large quantity of water on the one hand, and between the settlement spread, on the other hand, to the Water Commissioner, nor to the Director General of the Ministry of Agriculture, or anyone else, but it decided to destroy the water reservoir because it had laid down priorities".[320]

Yona Kahane told the Committee, that the first document that he has, that speaks of the wrong treatment at the Coastal Aquifer, is from 1959.[321] Menahem Kantor, who was Water Commissioner in the years 1959-77, does not deny that there was over-pumping in the Coastal Aquifer, but according to him this took place, to a large extent, due to ignorance.[322] Prof. Hillel Shuval expressed his opinion that the over-pumping in the past stemmed from the faith in the technological Messiah, that will arrive quickly, and with the help of cheap desalinated water, will enable us to repay the debt.[323]

Today, more than 40 years after the over-pumping in the Coastal Aquifer began, it is still taking place. According to the current Water Commissioner, Shimon Tal, the over-pumping is at a rate of around 150 million Cu.M per annum.

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[319] On the quality of water in the natural reservoirs see Yaron Fishman, *the Regulations on the quality of Potable Water in the Country and the World, and the Quality of the Water Sources in Israel*, Jerusalem, the Knesset Research and Information Center, July 30, 2001 (Hebrew)

[320] Evidence given by Meir Ben-Meir to the Knesset State Control Committee, on January 3, 2000

[321] Evidence given to the Committee by Yona Kahane, on December 23, 2001

[322] Interview with Menachem Kantor, held by the representative of the Committee, on February 9, 2002

[323] Interview with Prof. Hillel Shuval, held by the representative of the Committee, on February 3, 2002

> "To embark on additional wide-scale over-pumping, as proposed by he who made this proposal, definitely means a qualitative destruction of this aquifer".[324]

"He who proposed" is no other than Meir Ben-Meir. When Ben-Meir was asked by the Committee to react to a report that had appeared in *Ha`aretz* on May 31, 2001, in which he was quoted as proposing that one should increase "the pumping in the coastal plain to 600 million Cu.M per annum - 200 million Cu.M more than planned", Ben-Meir replied as follows: "I am speaking today of immediate reserves at the north of the reservoir".[325] The position of Ben-Meir is based on the assumption that due to the water shortage in coming years, there will be no escape from over-pumping from one of the reservoirs. In his opinion, the damage to the Coastal Aquifer can be calculated, and it is possible to deal with the movement of the point at which the sweet water meets the salty water westwards, by desalinating the aquifer, since the salinity of its water is rising, as a result of over-pumping, and the human activity taking place above it.[326]

In reaction to what Meir Ben-Meir had said to the Committee, Shimon Tal wrote:

> "My position is that the over utilization of the Coastal Aquifer is possible only if it can be ensured, that within three years we shall have the tools to return the deficit".[327]

Even though no one denies that there is over pumping in the Coastal Aquifer (See table No. 5), and the Operations Committee of the Water Commission has approved the increased pumping in the Northern part of the aquifer in 2002, by encouraging the owners of private rights, who had stopped drilling in the past, to renew the pumping and sell the water to the state at a price of NIS 0.45-0.65 per Cu.M, [328] there are differences of opinion among the experts on the question how to determine the red line in this aquifer. Prof. Haim Gvirtzman from the Hebrew University dealt with this paradox, in connection with the Water Commission's Master Plan:

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[324] Evidence given to the Committee by Shimon Tal, on July 1, 2001

[325] Evidence given to the Committee by Meir Ben-Meir on July 9, 2001. One should mentioned that this is the area where the Prime Minister recommended that a company, in which Ben-Meir is a partner, be allowed to drill without a tender

[326] Lecture given by Meir Ben-Meir to the symposium organized by the water associations, that took place in Kibbutz Afikim, on April 10, 2002

[327] Letter by Shimon Tal to the Committee, of August 16, 2001

[328] Report by Amiram Cohen, *Ha`aretz*, March 5, 2002

> "It says (in the Master Plan) that there are 118 million Cu.M missing in the Coastal Aquifer for filling the hydraulic craters. This means, that even though a red line was never defined for the Coastal Aquifer, this plan defines it by the way. It says: 'we must fill the Coastal Aquifer to level 0'. I think that this is not a correct definition, because if we reach level 0 in the Coastal Aquifer, this will be a catastrophic situation.. Therefore, perhaps the day has arrived to define the lower red line in the Coastal Aquifer... I have an idea how to define a red line. I am not sure that it is correct... but we must define an incline... if we shall use this definition... then there are 500 million CuM missing in the Coastal Aquifer".[329]

On the same occasion Yona Kahane differed with Gvirtzman, arguing that a red line certainly does exist. The red line, he argued, was determined on the day on which a plan was made regarding the coast, and that this line appears in writing in all sorts of places. At any rate, it would appear. that the matter isn't closed.

All the persons who spoke on this issue before the Committee agreed that the quality of water in the Coastal Aquifer is deteriorating. According to the former Director General of Tahal, Yehoshua Schwartz:

> "The Coastal Aquifer is in danger of crawling salination, and is also subject to the danger of contamination. The problem with this aquifer is that much of the human activity takes place above it, and therefore damage is also caused to the seeping of rain water, and pollution, as a result of many causes".[330]

But there are also those who argue that the salination hasn't yet begun. Thus, according to Yona Kahane:

> "We do not yet have salination in the coastal plain. The original plan for creating a one-time reserve says that we should let the sea enter 1,800 meters, following various considerations. It doesn't reach any further than that, or perhaps by 200 meters more at one point. But people are saying that the sea has caused salination. The sea has not caused salination, but it will if we shall continue in the same way".[331]

Prof. Arie Issar believes that there is no hope of preserving the Coastal Aquifer at potable water quality.

> "Gentlemen, it is like preserving the smell of the citrus trees of Jaffa, when I was a boy... One should turn (the Coastal Aquifer) into a second rate aquifer. In future Israel,

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[329] Comments made by Prof. Haim Gvirtzman at the symposium organized by the Water Commission on the subject of the Master Plan for the development of the water sector, that took place at the agricultural compound in Beit Dagan on January 30, 2002

[330] Evidence given to the Committee by Yehoshua Schwartz, on September 24, 2001

[331] Comments made by Yona Kahane at the symposium organized by the Water Commission on the subject of the Master Plan for the development of the water sector, on January 30, 2002

> within 30-40 years, there will be two water systems: one for service water, which is 80% of the urban demand, and the second potable water".[332]

The Mountain Aquifer

The Committee heard much less about the Mountain Aquifer - or the western part known as "Yarkon-Taninim" - than about the other natural reservoirs, since this aquifer is a common aquifer to Israel and the Palestinian Authority, and the Committee decided not to deal with those issues that are being dealt with by authorized political forums. Nevertheless, the Mountain Aquifer was mentioned in the Committee's meetings.

Regarding cooperation with the Palestinians the Water Commissioner stated in his first appearance before the Committee:

> "In accordance with the Interim Agreements, the Palestinians are pumping water from the Mountain Aquifer, and the Eastern Mountain Aquifer was allocated to them. They have not yet started developing it sufficiently, and the development is extremely expensive".[333]

The Minister for National Infrastructures added:

> "On the issue of water *vis-á-vis* the Palestinians, we are pumping from the same aquifer, from the same channels and the same rivers. There are many things, that we must do together with the Palestinian Authority. It is the same sewage water that flows from Bethlehem on the one side and from Armon Hanatziv or from Jabal Mukkabar on the other side, that pollutes the same water sources. Water in Hebron or in Kiryat Arba is the same thing. If there will be no water in Kiryat Arba, there will be no water in Hebron, and vice-versa... The Palestinian authority is not cooperating, but this does not absolve us from responsibility".[334]

The problem of over-pumping from the Mountain Aquifer was raised by the State Comptroller, in her special report on the management of the Water Sector in 1990:

> "In 1990 the red lines were first knowingly crossed in the mountain reservoir, which is today the main multi-annual reservoir in the water system, and the source of potable water for most of the large towns".[335]

The Water Commissioner admitted to the Committee, that the greatest danger of salination is in the Mountain Aquifer, since it borders on both seawater and fossil water.[336]

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[332] Evidence given to the Committee by Prof. Arie Issar, on July 30, 2001

[333] Evidence given to the Committee by Shimon Tal, on July 1, 2001

[334] Evidence given to the Committee by Avigdor Lieberman, on July 26, 2001

[335] The State Comptroller, *Report on the Management of the Water Sector in Israel*, Jerusalem, 1990, p. 53 (Hebrew)

While reporting to the Committee on the quality of the water in this aquifer, the Chief Hydrologist of "Mekorot" emphasized:

> "The Mountain Aquifer contains sweet water of the best quality among the three sources that make-up the skeleton of the national system. At the same time, due to the presence of adjacent brackish water, which is closely linked to the sweet water, it is important to preserve minimal threshold levels - in other words, not to go down below the red lines of +9 meters in the Northern part of the basin, and +12 meters in the Central part of the basin. We are speaking of a Karstean system, in which there are very rapid flows, and a decline to beneath the red lines, could lead to a rapid rise in the salinity...
> The moment that the brackish water will enter the pumping fields, it will be necessary to close down many drillings, and the damage to the water sector will be the loss of very large quantities of very high quality water (tens of millions of Cu.M per annum). The whole area between Tel-Aviv and Hadera is the area where the danger of salination is greatest. In the absence of observation and warning drillings, we do not know today where the front of the brackish water is, in relation to the pumping drillings. Only this year did the Commission allocate money and resources to drill observation drillings..."[337]

Former Water Commissioner, Meir Ben-Meir, explained that the lack of information regarding the Aquifer is extremely grave:

> "In the mountain reservoir there are two bodies of water. So far, insufficient work has been done - partly as a result of my own fault - to find out whether if we do not pump more sweet water, they will flow into the saline level and be lost, or whether if we do not pump much more brackish water, they will flow into the sweet level, and salinate it... Insufficient work has been done, because the Ministry of Finance knows how much money should be allocated to research - and that too is restricted".[338]

<u>The Sea of Galilee</u>

Among all the natural reservoirs of Israel, the Sea of Galilee is the only one, whose water level is visible to all. Soon after it began its work in July 2001, the Committee visited the installations of "Mekorot" at the Sea of Galilee and the Eshkol reservoir, and was impressed by the seriousness of the problem. The fall of the water level prevents sufficient pumping for the National Carrier; prevents water flowing Southwards to the continuation of the Jordan River; makes it difficult to supply water to Jordan in compliance with the agreements; and increases the danger of the Sea's water being salinated, and the appearance of pollution and

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[336] Evidence given by Shimon Tal

[337] Survey by Dr. Yossi Guttman, Chief Hydrologist at "Mekorot", on the quality of water in the Mountain Aquifer, during the tour of the Committee at the "Mekorot" installations in Rosh Ha'ayin, on August 22, 2001

[338] Lecture given by Meir Ben-Meir to the symposium organized by the water associations, that took place in Kibbutz Afikim, on April 10, 2002

algae (regarding the height of the water level of the Sea of Galilee, see Table No. 6). On August 2, 2001, the Water Commissioner fixed a new and controversial red line of -215.50 meters,[339] but in the beginning of March 2002, the Operations Committee decided, that the water level would not be brought below -214.30 meters.[340]

The problem of the Sea of Galilee results from the paucity of rain, and from local use of the water collecting basin, including on the Golan Heights, that prevents the flow of much water to the Sea of Galilee.

The representative of the Nature Preservation Society said to the Committee in his evidence:

> "A strip has been created around the Sea of Galilee, whose breadth keeps changing from 50 to 700 meters, between -209 to -213.95 meters, which is a source of neglect - I would even say criminal neglect".[341]

The representative of the Ministry of Science, Dr. Miriam Waldman, hinted in her questions to the witnesses, in the course of the Committee's meetings, that in her opinion one should weigh the possibility, that as soon as seawater desalination begins, the pumping from the Sea of Galilee should stop or diminish, and the Sea should be given an opportunity to recover. Prof. Arie Issar, also suggested that within the framework of a new and flexible Israeli water system, "there will be years in which we shall let the Sea of Galilee fill up, and there will be years in which we shall desalinate Sea of Galilee water, and then return it to the Lake".[342]

Speaking of the over-pumping from all the reservoirs, the head of the Planning Division in the Water Commission said:

> "The deterioration is such, that our wise hydrologists can no longer come and say what the significance of the low water levels in each of the reservoirs, where we are already at the red lines, is, and there is no one who can come and say what the effect is, and when it will appear. There are feelings, there are senses, but in quantitative terms it doesn't appear... We should like to give ourselves at least two years to return to the situation of historical red lines, for example, -213 meters in the Sea of Galilee..".[343]

The Committee supports the position of the former Minister for National Infrastructures and the Water Commissioner, that the over-pumping from the Coastal Aquifer should stop. As

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[339] The Hydrological Service recommended that this year the red line for the Sea of Galilee should not be allowed to go below -214.30 meters

[340] Report by Amiram Cohen, *Ha`aretz*, March 7, 2002

[341] Evidence given to the Committee by Yohanan Darom, on July 31, 2001

[342] Evidence given by Prof. Arie Issar

[343] Comments made by Dr. Yossi Dreizin during his presentation of the Master Plan for the Development of the Water Sector

has already been stated in the article dealing with the acts that the Government must perform urgently, the Committee recommends that the over-pumping in the Coastal Aquifer, as in the other natural reservoirs, should be limited to a minimum during the emergency period, and shall be stopped altogether later on.

Even though the Committee did not deal with the subject of cooperation with the Palestinians, it expresses its hope that the cooperation regarding the pumping from the common Mountain Aquifer, and preventing its contamination, should resume in the very near future. The Committee recommends that upon the entry of desalinated water into the system, and new policy regarding the management of the natural reservoirs in general, and pumping from the Sea of Galilee for the National Carrier in particular, will be decided.

9.7.2. Artificial Reservoirs

Already in 1952, within the framework of the first national Master Plan for the development of water projects, the construction of a system of artificial water reservoirs, in accordance with a plan prepared by the advisor on water to the Government in those days, Simcha Blass, was started. According to Blass' plan, it was proposed that over a period of 20 years, reservoirs with a capacity of 2,500-3,000 Cu.M should be constructed. Immediately the construction of experimental reservoirs, in various locations, began, but in 1956, it was decided to stop the project, since it became apparent that preventing the seepage of water through the floor of the reservoirs is more complicated than expected, and the solution too expensive.[344] To the problem of seepage one should add the problem of evaporation, the solution to which was also expensive.

Reservoirs for Collecting Effluents, Desalinated Water and Imported Water

Effluents

One of the difficulties in setting up a system for the reclamation of effluents, is the need to collect the water in the rainy season, for use in the dry season. Most of the effluents are produced in the center of the country, but in the center of the country the land is expensive, and consequently the collecting has to be done in the South, even if only part of the water will be used in the South.[345]

[344] The State Comptroller, *Annual Report No. 9*, Jerusalem, 1959, pp. 66-7

[345] Evidence given to the Committee by former Minister of Agriculture Haim Oron, on August 12, 2001

According to information given to the Committee by the Director General of "Mekorot", when one constructs a reservoir, one requires 120 dumans for every million CuM of water. "this land is worth money, and in the center of the country it is worth a lot of money".[346] During his appearance before the Knesset Finance Committee in March 2000, the then Deputy Water Commissioner explained, that in the case of every effluent plant, it is necessary to preserve 40% of the water in reservoirs.[347]

If one takes into account the costs of constructing the reservoirs and conveying the water, the costs of desalination, and the fact that before 2010 the supply of effluents will be greater than the demand for them, then it is necessary to weigh carefully the economic viability of the whole issue,[348] and perhaps pouring treated sewage water into the sea is not as absurd as it might seem at first sight. That is precisely the reason why the plan for the Eastern Conduit - the plan for conveying the effluent surpluses from the center of the country to the South, that was prepared in the 1990s - is not being implemented, and the Committee understood, that at the moment there is no intention to construct it, even though "Mekorot" has blue prints for the project.[349]

In the course of February, the Committee saw reports in the press about the Haifa effluents project, that supplies 35 million Cu.M of purified sewage water for irrigation, and of which 27 million Cu.M are absorbed "Mekorot", while the rest are currently being poured into the Kishon River and the sea, "Mekorot" was not able, for financial reasons, to construct a reservoir for holding them in time.

Desalinated Water

During its visit to "Mekorot" installations in Eilat, the Committee was impressed by the covered reservoir constructed to hold up to 200,000 Cu.M of desalinated water, and the measures taken at the site to prevent evaporation and sabotage.

According to the desalination tenders for installations along the Mediterranean, the intentions is that the desalination will take place continuously - in the summer and winter - so that at

[346] Comments made by Amos Epstein to the Committee when it visited the "Mekorot" installations in Eilat, on December 9, 2001

[347] Comments made to the Knesset Finance Committee by Zviki Nur, on March 9, 2000

[348] Comments made by Amos Epstein in Eilat

[349] Comments made by the Chairman of "Mekorot", Major General (res.) Uri Saguy to the Committee when it visited the "Mekorot" installations in Eilat on December 9, 2001

least for part of the year it will be necessary to hold the water in reservoirs.[350] The Committee was impressed, that as yet there is no clear plan regarding the holding of desalinated water - whether by means of artificial reservoirs or by means of using them to recharge the aquifers - and no one has taken this matter into account for the purpose of determining the final price for desalinated water, beyond the price when the water leaves the plant.

Imported Water

Despite the plan for conveying the water imported from Turkey (if and when it is imported) from the mono-buoy at the Ashkelon-Eilat Pipeline port in Ashkelon to the Zohar reservoir, it does not look as if anyone has given any thought to the significance of mixing the imported water, with water in the reservoir from other sources.

The Committee was impressed that a clear policy regarding the holding of "new"in reservoirs, and their being mixed with other water, has not been worked out, and hopes that this will be done soon, with maximal cooperation "Mekorot" and the Jewish National Fund.

Reservoirs for Catching Floodwaters

Even though the subject of catching floodwaters was mentioned during the meetings of the Committee only incidentally, and even then as a marginal subject, one should say several words about it.

Today most of the reservoirs for catching and absorbing floodwaters are constructed by the Jewish National Fund, in coordination with the Water Commission"Mekorot" and other bodies. Those planning the reservoirs are local authorities, water associations and private bodies. The JNF started dealing with the issue of the reservoirs towards the end of the 1980s, amongst other reasons, in order to find additional use for its heavy mechanical equipment.[351]

[350] It should be noted that the tenders for the construction of desalination plants, include an article, under which it is possible to temporarily stop the desalination, and then the State is obliged to pay those who run the plant a price that will cover their fixed costs, which is estimated at around 25 cents per Cu.M

[351] Prof. Dan Zaslavsky, *The Face of water in Israel*, the Ne`eman Institute in cooperation with the Jerusalem Center for Israel Studies, and "Haim Usviva", July 2001

From data that the Committee received from "Mekorot", based on the data of the Water Commission, it emerges that in the distribution of water consumption in Israel in recent years, floodwaters constitute around 2.5%:

Table No. 15: Floodwaters, as a Percentage of Total Consumption

	1993	1994	1995	1996	1997	1998	1999	2000
Total Consumption	1,762	1,813	1,981	2,071	2,092	2,262	2.157	2,032
Floodwaters	21	19	70	32	52	61	56	50
Percentage of Total	1.19	1.05	3.53	1.55	2.49	2.70	2.60	2.46

Based on Water Commission data, as presented to the Committee by "Mekorot". The data for 2000 are not final

The Director General of "Mekorot" touched upon the subject of the reservoirs for floodwaters, while explaining why the construction of such reservoirs is problematic:

> "When you fill a reservoir with floodwaters, as opposed to gathering sewage, that is renewed all the time, they do not renew themselves - once you have filled the reservoir, it remains full until the end of the winter. There are years when it doesn't fill. Then you must treat the water and use it at the beginning of the summer, prevent evaporation and seepage, and all that is connected with this. I am not speaking of the cost of constructing the reservoir".[352]

Prof. Dan Zaslavsky argues that no calculation was made as to whether is it worth while constructing reservoirs by means of the JNF. According to him, since the reservoirs as they are being constructed today are expensive, it is preferable that the water being caught, should be conveyed, as soon as possible, into the potable water supply network, after chlorination, without the need to for prolonged storage. He also proposes not to insulate the reservoirs, but to enable the water to filter, as quickly as possible, into the ground water.[353]

The head of the Development Enterprises Department of the JNF, Moshe Cohen, presented data to the Committee, from which it emerges that until the end of 2001 the JNF had constructed reservoirs with a capacity of 109.91 million Cu.M at a cost of NIS 455.07 million, where close to 40 million Cu.M of the capacity was for floodwaters. The use made of this water is primarily for irrigation, dilution with effluents, and fish ponds. For the years 2001-2004, reservoirs with a capacity of 154 million Cu.M have been planned, at an expense of

[352] Comments made by Amos Epstein in Eilat

[353] Prof. Dan Zaslavsky, *The Face of water in Israel*

NIS 693.1 million, of which 41.7 million Cu.M will be for sweet water and 112.3 will be for effluents.[354]

The Committee has no recommendation regarding reservoirs for floodwaters, except for the suggestion, that Prof. Zaslavsky's arguments and proposals be seriously considered.

9.8. The Quality of the Water

The essence of the water crisis is customarily divided into a problem of quantity and a problem of quality. The problem of quality emerges when the water is not drinkable, and/or good enough for irrigation, and/or is the cause for damage to the environment. The problem of the quality of water emerges both when we are speaking of natural water, that for various reasons has been salinated or contaminated, and when we are speaking of "new" water - in other words, desalinated water, reclaimed water and even imported water - and it is necessary to ensure that this water is of appropriate quality, and can be diluted with existing water, without causing damage.

Among the reasons for the deterioration in the quality of the natural water in Israel one can list over-pumping; the flow of raw sewage; the seepage of various chemical materials that are to be found in the sewage water into the ground water; the use of fertilizers and effluents in agriculture; industrialization and fuel leaks. Treatment of the problem could be by means of prevention, or on the side of treatment after the damage has been caused. Prof. Dan Zaslavsky argued during his appearance before the Committee, that in the past, when the economic account of the cost of desalination was made, no one took into consideration the costs of repairing the damages caused to the quality of the water in the aquifers, due to over-pumping, in the absence of desalination. According to him, if one takes into consideration the price of repairing past and current damages, there is no economic reason not to start desalinating 500 million Cu.M of seawater immediately.[355]

[354] Information given by Moshe Cohen to the Committee's representative on March 11, 2002

[355] Evidence given to the Committee by Prof. Dan Zaslavsky, on July 15, 2001

The Committee did not delve upon the technical and scientific side of this subject,[356] but was impressed that in Israel, the know-how exists to treat the problems of water quality after they are created, as long as the damage is not irreversible, and that by means of laws, regulation and supervision it is possible to prevent the emergence of most of the problems.
On the subject of the quality of effluents, the Committee heard, that the know-how as to how to deal with most of the harmful substances in this water, including Boron which, constitutes a special problem, exists, and that this can be done either by means of additional purification or by means desalinating the effluents.[357] In the past several committees were appointed to deal with the issue, the best known of which was the Committee chaired by the late Prof. Dan Yaron. This Committee, whose work was backed by the World Bank, held discussions for seven years, and issued a report in 1999.[358] Today, the Inbar Committee, that will fix the standards that are required for the purpose of the updating the regulations, is holding meetings. The regulations regarding the quality of potable water, are based on the People's Health Regulations (the health quality of potable water) 1974, and the subject of the contamination of the water sources is dealt with in the Water Law 1959.

According to Prof. Zaslavsky, the issue of the quality of the water was not properly dealt with in the past because "it would appear that the decision makers just didn't care about the issue, or that the issue was lost in the bureaucratic labyrinth". Among other things, Zaslavsky identifies problems in the contemptuous approach of the authorities to the subject of pollution in the spheres under their responsibility, in lack of coordination among the various bodies and institutions dealing with the subject of examining the quality of the water, and in the difficulty of fixing standards regarding all the thousands of substances that might be found in the water.[359]

The green bodies in Israel, that brought in the past, and continue to bring in the present legal cases on issues connected with the contamination of the ground water - both to the District Court in Haifa, while siting as a Court for Water, and to the High Court of Justice - argue that

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[356] The Committee received from Yaron Fishman, of the Knesset Research and Information Center, a background document on the subject of *Regulations Regarding Potable Water in Israel and the World, and the Quality of water Sources in Israel*, of July 30, 2001 (Hebrew)

[357] See for example evidence given by Haim Oron to the Committee on August 12, 2001

[358] Evidence given to the Committee by Dr. Amos Haddas, from the Institute for Soil, Water and Environment Sciences, at Beit Dagan, on August 8, 2001

[359] Prof. Dan Zaslavsky, *The Face of water in Israel*, the Ne`eman Institute in cooperation with the Jerusalem Center for Israel Studies, "Haim Usviva", July 2001, pp. 80-83

"the courts in Israel, and especially the High Court of Justice, have little if any interest in the subject of the environment".[360]

The Water Commission's Master Plan for the development of the water sector includes a chapter on water quality. The chapter opens with the words:

> "The quality and salinity of the water in the sources and supply systems, were always a consideration in the administration of the water sector. The weight of this consideration never reached the level of interest as when we dealt with quantitative or economic aspects. The regulations regarding the quality of water, the concentration of brine and the prevention of contamination, were dealt with as constraints, and not as variables in a decision. This trend is progressively changing. This issue will be central, and its importance will grow, and its ramifications on the Plan are presented here".[361]

The issues, which the plan deals with after this introduction are as follows: the quality of potable water; water security (i.e. security from sabotage); surface water sources; ground water; treatment of sewage and its reclamation; and the salinity of effluents and their desalination - all these at a primary level.[362]

The Committee appreciates the efforts being made by the various factors, both in Ministries and elsewhere, to put an end to the continued deterioration in the quality of water in Israel, and the measures taken to improve its quality. The Committee expresses its hope that the issues mentioned in the Water Commission's Master Plan will enjoy serious and appropriate treatment. The Committee recommends that the legislation should be adapted to the requirements in this sphere, and that all the necessary resources should be allocated, in order to enforce the existing laws and regulations. The Committee also recommends that the effort to bring the grave results in terms of the quality of the water, that could be caused by the continued over-pumping, in the absence of decisions that will prevent this phenomenon - to the attention of the decision makers.

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[360] Letter sent to the Committee by attorney Alona Carro-Japhet from the association "Man, Nature and Law", on March 3, 2002

[361] The Ministry for National Infrastructures - the Water Commission, *Master Plan (transition) for the Development of the Water Sector in the Years 2002-2010*, Final Report, April 2002, p. 39

[362] Ibid. pp. 39-44

9.9. Water for Nature

Until recently, one always spoke about water for agriculture, water for urban needs and water for industry and services, but not about water for nature. It transpires that in normal times, nature consumes around 150 million Cu.M per annum, most of which eventually returns to the aquifers.[363] However, as a result of the current water crisis, the water does not reach its destination by natural ways, and as a result, around 100 out of 160 wet habitats in Israel, have been destroyed.[364] On July 18, 2000, the Ministerial Committee on Economic Affairs adopted a resolution to set up a team, headed by the Water Commissioner, and with the participation of the representatives of the Ministry for the Environment, the Ministry of Agriculture and the Ministry of Finance, that within 60 days would present recommendations regarding the manner of realizing the allocation of 50 million Cu.M of water per annum for nature.[365] Close to two years have gone by since then, and nothing has been done regarding this issue.[366]

While presenting the Water Commission's Master Plan, Dr. Yossi Dreizin mentioned the issue of allocating water for nature, and especially the rehabilitation of the rivers, and turning them into qualitative centers of nature, on the basis of a plan prepared by the Ministry for the Environment. He argued, however, that it would not be possible to attain this rehabilitation before 2015.[367]

Nevertheless, in the final version of the Master Plan, there is mention of preparations for the allocation of 25 million Cu.M of sweet water per annum for nature requirements this year,

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[363] Evidence given to the Committee by Aharon Vardi, the Director General of the Nature and National Parks Authority, on July 31, 2001

[364] Evidence given to the Committee by Eli Saddot, the Acting Chief Scientist of the Nature and National Parks Authority, on July 31, 2001

[365] Government resolution No. 2117 (EC/46) of July 18, 2000

[366] In the last version of the Water Commission's new Master Plan, the following was said about this resolution: "This resolution is supposed to be implemented on the basis of a recommendation of the Water Commissioner, as chairman of a team in which the representatives of the Ministry for the Environment, the Ministry of Agriculture and the Ministry of Finance are also partners". Nothing was said about any progress made on the issue. *Master Plan (transition) for the Development of the Water Sector in the Years 2002-2010*, p. 15

[367] Comments made by Dr. Yossi Dreizin at the symposium organized by the Water Commission on the subject of the Master Plan for the development of the water sector, that took place at the agricultural compound in Beit Dagan on January 30, 2002

and of 50 million Cu.M in 2010. The possibility was also mentioned of using high quality effluents, instead of sweet water.[368]

Today the Water Law defines the following uses for water: household needs, agriculture, industry, crafts, trade and services, and public services.[369] The green bodies in Israel are suggesting that the supply of water for rivers and nature values, be added as well.[370]

Since the importance of nature is not only aesthetic, and it has first rate ecological importance, the Committee recommends that the issue of the water requirements of nature be recognized in the Water Law.

9.10. Data and Data Bases

In the course of its work the Committee was impressed, that even though the Hydrological Service by the Water Commission, publishes data about the quantity of rain, the flow of water, levels of pumping, the level of the table of the ground water, the qualities of water, potentials etc.; even though the Water Commission publishes, on the basis of data that it receives from "Mekorot", forecasts pertaining to demand and water consumption; the task force for observing the Sea of Galilee, collects data at the lake and its drainage area, and there are additional source of data; most of the figures are published with a delay of one and a half to two years,[371] and they are frequently controversial. Among the figures about which the experts do not agree are the water potential (see article 5.1.), the quantity of effluents being poured into the Sea (see paragraph 9.6.3.), the red lines in the natural reservoirs (see paragraph 9.7.1.), the cost of water (see article 9.5.) etc. The Committee was also surprised to discover certain differences between the data published by the Hydrological Service and the Water Commission itself, regarding the consumption of water. The differences apparently result from differences in definitions.

In his evidence before the Committee, Prof. Yona Chen, from the Hebrew University, argued, that there is need for a central system of data and an improvement in the national data bases.

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[368] *Master Plan (transition)*, p. 16

[369] The Water Law, 1959, article 6

[370] Evidence given to the Committee by Dr. Alon Tal, on December 23, 2001

[371] Comments made to the Committee by Erez Yamini on July 10, 2001

He added that in the Water Institute in the Haifa Technion a data base system was being set up, but that most of the data appeared in the English language.[372]

The Committee recommends that an effort should be made to publish complete, authoritative and up-to-date data in all spheres of the water sector, and that the source of the publication should be one. In addition, it is recommended that just as the Central Bureau for Statistics publishes temporary up-to-date data in various spheres, and corrects them when it receives more accurate data, until such time as it can publish final data, this should also be done by the body that will be responsible for publishing the water data. In the case of differences of opinion regarding a certain figure, and the existence of several estimates, the various figures should be published. The decision makers, and the public at large, have a right to receive as full and as accurate data as possible.

9.11. Academia and Research

Even before the establishment of the state, academicians were involved in the vision, planning and execution of projects in the sphere of the water sector. Academicians were also involved

over the years in criticism of the planning of the water system in Israel.[373]
When the grave water crisis broke out in 1986, a group of over a dozen scientists decided to act, and to warn the Government in public of the faulty administration, in their opinion, of the water sector, and especially the continuous over-pumping.[374] However, not all the academicians were willing at that time to speak out openly, since some of them were connected to the official water bodies with advisory contracts, and they were afraid to express public criticism.

[372] Evidence given to the Committee by Prof. Yona Chen, on December 23, 2001

[373] See, for example, Yitzhak Galnoor, *The Planning of the Water System in Israel*, Jerusalem, the Van Leer Institute, the Jerusalem Group for National Planning, 1975, (Hebrew) and Uri Shamir, Yaacov Bar, Nathan Arad, Yossef Vardi, N. Salbest, and Yitzhak Galnoor, *Alternatives for Israel's Water Policy*, Haifa, the Technion, the Shmuel Ne`eman Institute for Advanced Research in Science and Technology, 1985 (Hebrew)

[374] See for example "The scientist are crying out: the water sector is stuck deep in the mud", *Yedio'ot Aharonot*, of May 27, 1986, and "The water deficit could grow within 10 years by about two thirds", *Ma''ariv*, of June 11, 1986. Among the scientists involved in the campaign were: Prof. Yoram Avnimelech, Prof. Yaacov Bar, Prof. Yitzhad Galnoor, Dr. Aharon Viner, Prof. Ya`ir Mondlak, Prof. Shmuel Mendel, Prof. Hillel Shuval, and Prof. Uri Shamir

One might assume, that Israel's situation in the sphere of academic, and applied research, ought to be excellent. In the Haifa Technion and Ben-Gurion University in Beersheba, there are research institutes that deal with water,[375] and in the rest of the Universities there are engineers, geographers, hydrologists, geologists, chemists, biologists, economists, political scientists, Middle East experts etc. dealing with the water issue. In addition, applied research is being done within the framework of institutions such as the Institute for Soil, Water and Environment Sciences at Beit Dagan, which is attached to the Ministry of Agriculture, and the Hydrological Service, which is attached to the Water Commission. Nevertheless, the Committee heard that the state of research in Israel in the sphere of the water sector is in a sorry state.

According to Dr. Miriam Waldman, head of the Agriculture and Environment Section in the Ministry of Science, who represented her Ministry in the Committee's meetings, for years the national research budgets for topics connected with the water sector, have been declining.[376] Most of the existing budgets come from abroad - especially from the European Union and individual European states such as Germany, whose orders of priority are different to those of the State of Israel, so that not all the studies that they finance, are relevant to the problems of Israel.

What the Israeli researchers need, argued Prof. Ora Kedem, are funds with which they can work on studies, that correspond to the requirements of Israel and not of Germany. She added that even when one is speaking of Jewish donors from abroad, they wonder why the Government of Israel does not support studies that appear to serve its interests. Government assistance can serve as a lever to increase the contributions from abroad.[377]

Prof. Uri Shamir, who has been successful in raising money for the research institute that he heads, warned that one cannot continue to depend over time on the good will of donors and funds, and that therefore "one must increase significantly state investment in research and development, and in the training of professional manpower".[378]

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[375] In the Technion there is the Grand Water Research Institute, which is headed by Prof. Uri Shamir, and within its framework there is the Rabin Laboratory for Desalination headed by Prof. Raphael Semiat. At Ben-Gurion University there is the Laboratory for the Study of Desalination and Water Treatment, headed by Prof. Ora Kedem.

[376] See also the Ministry of Science and Arts, *the Policy for the Advancement of Hydrological Research and Development in the State of Israel* - Report of the Israeli Committee for Hydrology, prepared by Dr. Avraham Markado, Jerusalem, January 1995 (Hebrew)

[377] Evidence given to the Committee by Prof. Ora Kedem, from Ben-Gurion University, on January 21, 2002

[378] Evidence given by Prof. Uri Shamir to the Committee, on November 25, 2001

The Committee received the following data regarding the source of research funds in the mid 1990s: around 20% of the financing for studies on the subject of water comes from the Government of Israel and its agencies;[379] around 10% comes from commercial companies; around 8% from University sources, funds and donors; around 25% from the United States and around 40% from European sources.[380] The Committee does not have exact figures regarding the absolute sums invested in research on the subject of water, but the impression is that we are speaking of several tens of millions of Shekels only.

One of the results of the absence of proper treatment by the State regarding the issue of allocating resources, is that the cadre of professionals in the sphere of hydrology and water quality is diminishing, exactly at a time when there is an urgent need for them.[381] Prof. Gideon Dagan, from Tel-Aviv University, spoke of this in detail:

> "Israel was once a country that could be proud of its achievements in the sphere of water, thanks to a combined alignment of long-term and comprehensive planning, that was in the hands of 'Tahal', execution, that was in the hands of 'Mekorot', follow-up and enforcement in the hands of the Water Commission, and basic applied research and training of manpower, that was academia... In the beginning, 30-40 years ago, the emphasis was on how to use the water at our disposal. Today the emphasis is on how to preserve it and how to maintain its quality. These are much more complicated and complex problems... In other words, we are in a situation, where on the one hand the problems are much more complex, and on the other, the professional ability of the system is declining, and the professional force is getting progressively older".[382]

Among the specific commends heard by the Committee, that it finds worth mentioning:

* The cooperation between the academic community and the Government offices, should be more effective, and deal with subjects on a much wider range of practical problems;[383]
* There is a need to increase the number of initiated studies, in which a large number of

[379] In his evidence to the Committee, on December 23, 2001, Prof. Yona Chen stated, that out of the budget for non-military R&D (which in itself is insufficient) only 0.3 percent goes into R&D related to the environment and water, and of this 25-30% goes into water

[380] Evidence given by Prof. Yona Chen

[381] Comments made by Dr. Miriam Waldman to the Committee on September 24, 2001

[382] Evidence given to the Committee by Prof. Gideon Dagan, on Augsut 13, 2001

[383] Evidence given to the Committee by Dr. Sinaia Netanyahu on September 24, 2001. *Inter alia* Netanyahu argued that "I do not think that the academic community was asked to examine the subject of how the structure of the water sector will look in the age of desalination"

researchers from various academic institutions and different disciplines participate;[384]

* It is worth investing for the long run in the establishment of a professional body, that will engage in research on the subject of water on the basis of the model of a Government institute, such as the Geological Institute, or that will be connected to some university.[385]

In fact, the Water Commission recently turned its research unit into a department, and placed at its head a director with a doctorate, who is expected "to put some order into the subject of research in the sphere of water".[386] However, when he dealt with the Master Plan that the Water Commission had presented, Prof. Avner Adin expressed his disappointment from the fact that the subject of research had been presented in so modest a form, when 3-4 percent of the budget should be allocated to R&D. He added:

> "There is no reason why the center of research activity, and even decision making up to a certain level, should not take place outside the Water Commission. But there must be some staff activity that will coordinate whatever is done in this country".[387]

The Committee recommends that in the sphere of its policy regarding water, the State should place the issue of research on a high level in its order of priorities, and for this purpose should allocate a much greater volume of resources than it does today. Should a water authority be established, I is important that it should include a department for the management of research, that will allocate resources for research in academia, research institutes, and industry in subjects that are important for the Israeli and regional water sector. Until such time as a Water Authority is established, the management and direction must be performed by the Water Commission, in full cooperation with the Ministry of Science, Culture and Sports.

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[384] Evidence given by Dr. Miriam Waldman and by Prof. Yona Chen

[385] Evidence given by Prof. Gideon Dagan

[386] Evidence given to the Committee by the Water Commissioner Shimon Tal, on September 24, 2001

[387] Comments made by Prof. Avner Adin at the symposium organized by the Water Commission on the subject of the Master Plan for the development of the water sector, that took place at the agricultural compound in Beit Dagan on January 30, 2002