

Losing the Sea of Galilee?

Shimon Shatzmiller*

Department of Chemical Sciences, Ariel University, Ariel, Israel

***Corresponding Author:** Shimon Shatzmiller, Department of Chemical Sciences, Ariel University, Ariel, Israel.

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Abolishing water management failure in Israel

"Stop of the rains in Israel" is a phenomenon that has existed in the region for thousands of years, you can say from the days when Abraham was to go down to Egypt to break a break, it is not new. Israel and neighbor exist in a semi-arid region of the planet "Earth".

One of the most beautiful legends in which to overcome rain stops is the legend of "Honi the circle". According to the legend, by fencing himself in a circle, he managed by way of a miracle, to bring rain.

Apparently, Rabbi Gafni is also waiting for Honi the circle and so does the Minister of Agriculture.

But in modern Israel a water authority was established. This authority must ensure that all existing technology is implemented so that we can continue to live in Israel and her neighbors. Drink to saturation and maintain agriculture in our desert conditions. It's a bureaucratic commission.

In dozens of scientific publications, we praise Israel's ability to produce megatons of desalinated water from the sea [1]. Israeli scientists and engineers have overcome the technical problem and with proper management and funding, take out drinking water from salty water. Great, but when it comes to politics and bureaucracy, the matter fails.

Water from the Western Galilee (Asher's domain) of the Sea of Galilee.

The tribe of Asher, nowadays "Mate Asher" (the son of Jacob, Bible) was blessed with rainfall of about 700 millimeters a year, and this brings about 1.5 to 1.25 thousand megatons of rain (1.25 - 1.5 billion tons of water).

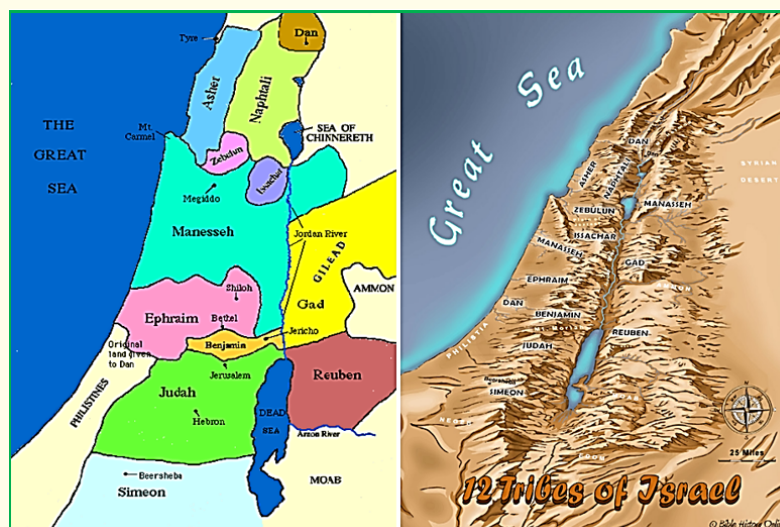


Figure 1

Assuming that the surface area of the Sea of Galilee is the area of "Mate Asher," this amount of water is enough to fill each year approximately one meter from the Sea of Galilee level. We would like to say that these skies are currently lacking and will enable preservation of the level of the lake, as well as irrigation of the Jordan Valley and the desalinization of the Dead Sea.

In order to transfer water to the Sea of Galilee from the shores of the Mediterranean, there is a relatively low barrier of about 100 meters to Nahal Hilazon. The drainage of the river and the storage of the water in the lake that will be created will enable the stream to flow along the Nahal Tzalmon River to the Sea of Galilee.

The energy that can be exploited from the fall of 200 meters.

The storage of the rainwater from the Betzet stream, from the Lotem to the Sea of Galilee area, can be controlled by means of a hydroelectric power station that can cover all the energy expenditure of pumping water and bringing it to the Nahal Hilazon Lake.

At the peak of its operation, a desalination plant at Shimat will produce 150 megatons of desalinated seawater.

This is the estimated amount that a snail takes during one rain season and is groomed by building a dam in Nahal Hilazon to store it as a gift from nature.

The Government of Israel formulated a plan for the rehabilitation and storage of the waters of the Western Galilee and the Kishon Basin <http://www.israel.agrisupportonline.com/news/csv/csvread.pl?show=7112&mytemplate=tp2>.

The main points of the plan approved today by the government

Construction of two additional desalination plants - the desalinated water production capacity target for 2030 will be set at 1,100 million Cu.M per annum, which is close to the doubling of production capacity today and will be re-examined in 2023 according to the state of the water sources. The desalination target will be increased to at least 1,200 million Cu.M per annum, after examination by the Water Authority Council. Israel currently has five desalination plants, which supply 585 million cubic meters of desalinated water per year, and two new desalination plants in the Western Galilee and Sorek have been set up, which will increase water production capacity by 300 million cubic meters a year. In addition, preparations will be made for the addition of an additional 100 million Cu.M and the need for an addition will be examined in 2020.

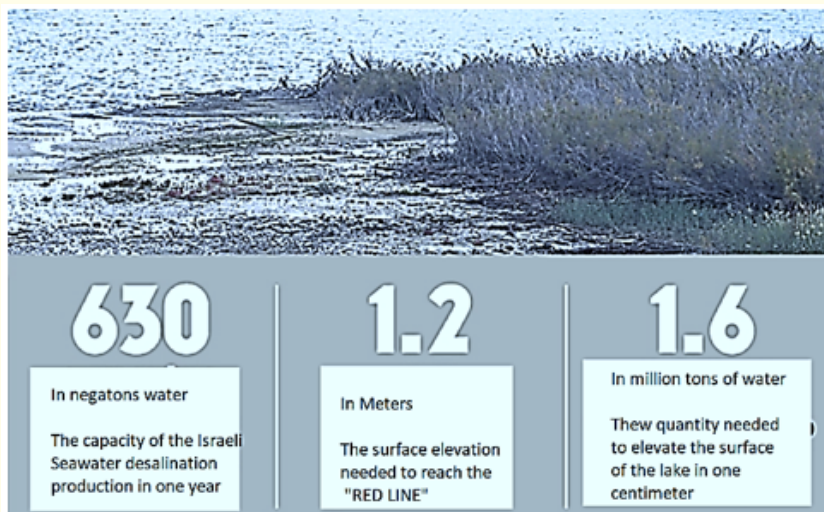


Figure 2

The "Western Galilee river rehabilitation program", funded by the Minister of Energy, was designed under the guidance of the Minister of Energy, with the aim of rehabilitating 7 streams in the north of the country, and the largest amount of NIS 25 million will be invested in each stream. In the Nahal Kishon, Hadera and Zippori streams, 20, 19 and 17 million NIS will be invested, respectively, and the streams of Betzet and Einan will be reduced to produce water from the stream. Supply of water to the stream from the national system, etc. The plan will be completed by 2023 and will be carried out jointly by the Ministry of Energy, the Water Authority and the Fund for the Reconstruction of Open Spaces.

The flow of desalinated water to the Sea of Galilee - the water of the Sea of Galilee, whose water level is currently at an unprecedented low, will be connected to the national system so that it will be able to discharge desalinated water from south to north to an annual level of 100 million cubic meters. The water level will be improved and within two years the flow capacity of 30 million m³ from the existing sources will be implemented, and within four years the flow capacity of 100 mcm will be implemented based on the additional desalination capacity established by the decision, In accordance with the decision of the professionals.

The northern section of Israel, The sea of Galilee (Kineret) and Nahal Kishon (MARKED BY BLUE SPOTS), Nahal Bezet (north) and Nahal Hilazon-Naaman (south).

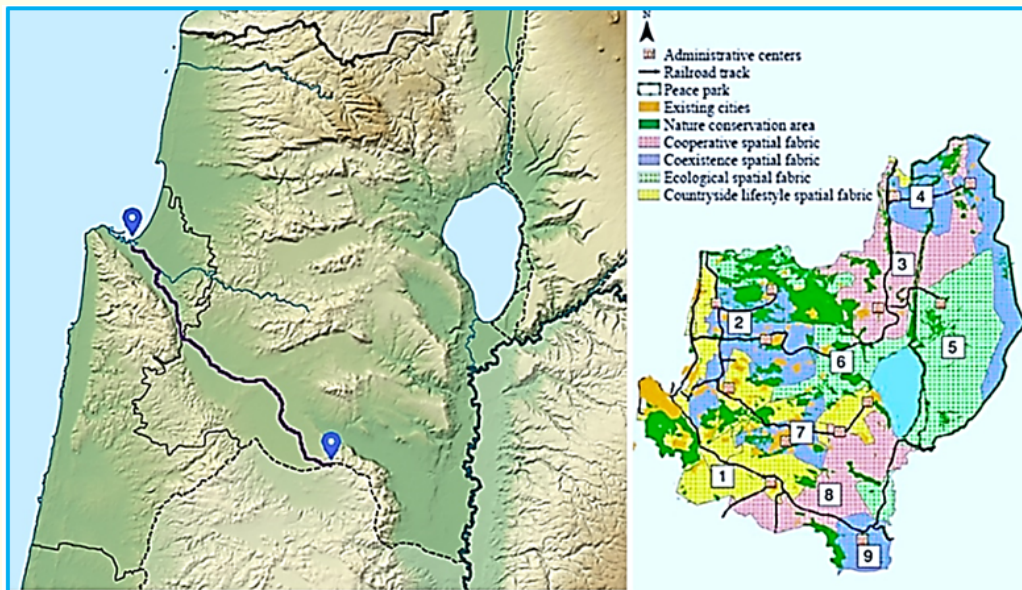


Figure 3

We were recently informed that after 7 years of procrastination, the establishment of the northern water plant in Shomrat was approved. This plant has the ability to save the Sea of Galilee, the agriculture in the Jordan Valley and the peace treaty with Jordan. But we inform the stewardess that the desalination is not enough. We offer the solution and we have to reduce it. This is not just a shower; it is actually a reduction, if not elimination of irrigated crops and all our milk market.

To reduce consumption is beneficial, but desalination works and succeeds. The government bureaucracy failed and it is the responsibility of those responsible for bringing the law to justice and to draw personal conclusions and all this immediately.

Now the trough is broken, even Choni will not save Israel from this colossal failure.

The rain that has hit us recently, and the impressive achievements in the desalination of seawater in Israel, do not change the fact that the demand for drinking water and water for agriculture, gardening and industry will only increase in the coming years. In order to provide the sweet water needed for Israel's population, a dramatic increase in the quantity of desalinated water will be required, from 600 million cubic meters a year to about 1,500 million cubic meters by 2050. This emerges from the Water Authority's master plan for the water sector.

Since desalinated water is expensive relative to other sources, attempts are being made to locate alternative sources of desalination. Two studies conducted at the Technion present such alternatives: first, expanding the reuse of water by utilizing gray water; The other, exploitation of rainwater in urban areas. The two studies were presented at the "Water Research in Israel - Future Generation for Research and Industry" conference held recently at the Technion in Haifa.

Distributed treatment system

Municipal wastewater is a significant source of water, and suitable treatment allows for use in irrigation and industry. It should be noted that in some countries, of which Israel is not a single member, effluents are treated even for the domestic water system.

How Does It work? The method currently used is the collection of sewage from the homes of residents, public institutions and industrial areas, and their transportation to a central treatment facility, which has many advantages in controlling and controlling the efficiency of the process.

In spite of the advantages of these central systems, a professional discussion has emerged in recent years with a new approach: a decentralized system of treatment. In such a system the gray water (collected from showers and wash basins) is separated from the general sewage stream. The gray water undergoes simple local treatment and is then used for flushing toilets and irrigating gardens. The rest of the sewage is discharged into the sewage treatment plant.

Gray water-dispersed treatment carried out at the building or neighborhood level has significant economic and environmental benefits, including reductions in energy consumption and operating costs, and strengthening community involvement in the process. This is similar to installing solar panels on private roofs or growing food on green roofs.

In Tamar Ofer's study, the current centralized approach was compared with three alternatives that include urban reuse. The study, conducted under the guidance of Prof. Eran Friedler and Prof. Aviad Shapira of the Faculty of Civil and Environmental Engineering at the Technion, examined the following alternatives: separation of the gray water from the sewage and its recycling at the level of the individual building, separation and recycling at the level of the building (a block of eight buildings) Return to town. For all the alternatives, a complete lifecycle analysis was conducted, which included three areas: cost, environmental impact and social benefit.

The gray water cycle turnover at the structural level was the best of the three. This alternative is characterized by energy saving, mainly due to reduced quantities of desalinated water (desalination is a relatively expensive process from an energetic point of view) and the reduction of drinking water discharged to the city and the effluent discharged to the sewage treatment plant. Pollution of natural water sources and the emission of many pollutants associated with the life cycle of municipal sewage.

Distributed water treatment systems already exist today and there is no technological impediment to their integration into the Israeli water economy. The treatment units tested in this study were RBC type, based on biological treatment using microorganisms fixed on a rotating substrate immersed in treated water. At the end of treatment the water is disinfected. The home care facility can be placed in the yard of the building or on the roof, but in any case a separate pipeline is required to transport the water to and from the installation.

It is noted that the most significant challenge in recycling gray water is not technical but legal and bureaucratic, since today the area is not regulated legally.

Another way to increase the quantity of water available in Israel is to collect runoff - water from roofs of buildings, sidewalks, roads and other places in built-up areas. Today, most of these water flows into the municipal sewage system, meaning that they are not being

exploited. Researchers from the Technion and the Hebrew University, funded by KKL-JNF, decided to examine how to change the situation and to examine the quantity and quality of runoff in a typical city in Israel: Kfar Saba. The researchers examined three different drainage areas in the eastern part of the city: And a section of a road near a natural plant.

Adi Haft, a graduate student at the Technion Israel Institute of technology, presented a summary of the results of the study: The industrial zone produces twice the amount of runoff from those producing residential areas. The reason for this is the high percentage of built-up area out of the total area. However, when the scientists examined the quality of the water they discovered that there are high concentrations of phosphorus, aluminum and titanium - substances that are dangerous to human health. Water from homes also measured relatively high values of pollutants such as heavy metals and phosphorus.

The researchers found that the runoff in the eastern part of Kfar Saba (and apparently in other cities in Israel) has double the concentration of pollutants than is customary in cities around the world, and Haft explains this by the significant difference between one rain event and another. "In Israel," says Haft, "every rain becomes the first rain, while in other countries rain is a routine matter". How does that happen? "After a long period of dryness accumulating on the roads and surfaces built of different pollutants, washed at high concentrations to the drainage system with the arrival of the first significant rain".

Haft's research indicates that the runoff of "Kfar Saba" does not meet the standard standards and therefore should not be discharged into the sea or rivers without prior treatment. This water treatment will enable their utilization for uses such as irrigation. Such a challenge is not particularly complicated for the Israeli scientific community, which already knows how to turn seawater into drinking water.



Figure 4

The water conveyor region as seen from space: Red circle – the west galilee seasonal streames harnessed. Blue region- accumulation reservoirs for the seasonal rainfalls of "mate Asher" Green the thiazole conveyor and caramel lake. Yello arrow the 200-meter waterfall for electricity production.

Several local rainwater reservoirs can be found in the Western Galilee and the Lower Galilee. But it is necessary to use about 1200 megaton rainwater to fill the Sea of Galilee or the Coastal Aquifer. For this purpose, a plant [2] like the "Menashe plant" or "Shikma plant" and the "Menashe" reservoir should be constructed and the water should be channeled to the mother of the national drainage - the Sea of Galilee. The Sea of Galilee urgently requires about 850 megatonnes of freshwater for rehabilitation. Here are the source and possibilities

for responding to this situation. The topography of the Galilee and the Sea of Galilee allow the use of gravitation for the partial transport of these water from the Galilee streams and the reservoirs that will be towed to the lake, drainage based on the channel and the flood waters of the Nahal Hilazon in the Carmel area from Tzurit to the Hazon vicinity. From here to the Sea of Galilee, the 200-meter slope will be used to generate electricity at a hydroelectric station that will be built in the Migdalah area and will provide energy for the entire project.

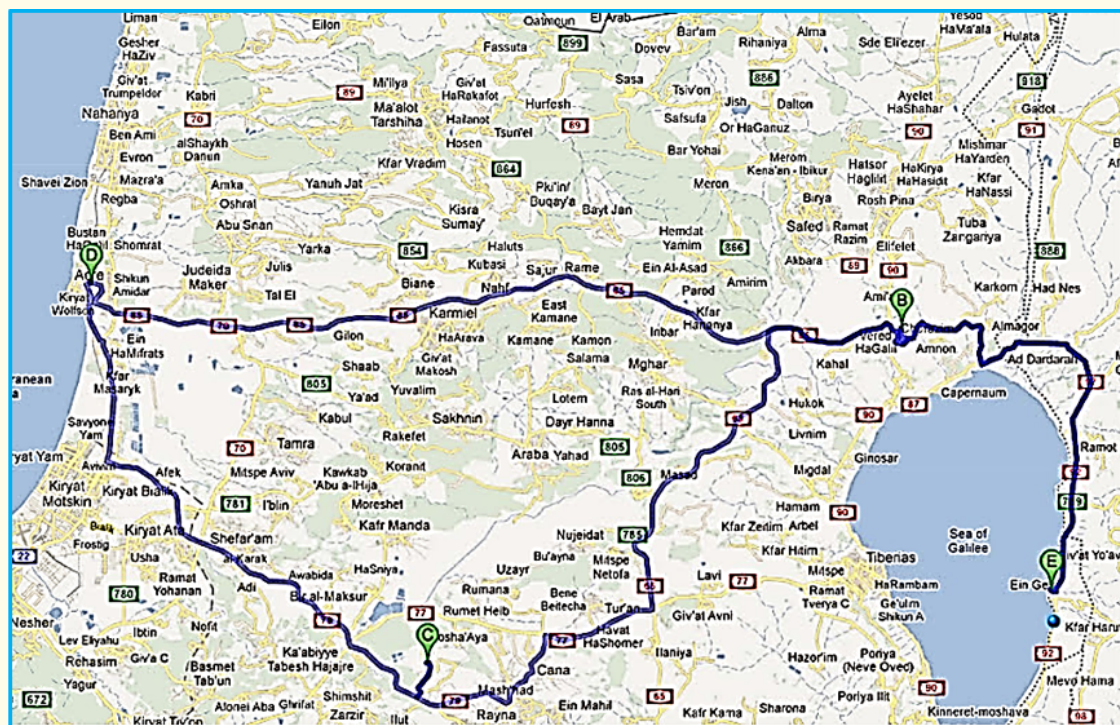


Figure 5

The lower galilee and main road crossing from the Mediterranean to the Kinneret

Through the Tzalmon Stream or through the National Water Carrier.

The project involves the following streams: Western Galilee creeks, Kishon River, Naaman River, Hilazon Seasonal river, Tzalmon Seasonal River flows to the sea of Galilee.

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