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Israel: Battling Water Scarcity

Israel is a diminutive country, about the same size as Maryland. It is 290 miles in length and eighty-five miles across at its widest point. Around seven million people live and work within Israel's borders ("Israel: Basic"). Although natural resources are scarce, the country is advancing rapidly and has become a world leader in technology and agriculture. However, drought and a swiftly multiplying population have led to a severe water crisis, crippling many small farmers and affecting every Israeli.

The population is predominantly Jewish, but 20% of the inhabitants are Arabs. The proud history of the Jewish people in Israel spans thirty-five centuries. Since the state of Israel's establishment in 1948, it remains the only democracy in the Middle East. Israel's citizens enjoy the right to vote, freedom of the press, and religious freedom. All Israelis enjoy equal access to education, employment and health care. Their constitution, judicial system, and elected parliament ensure the rights of a diverse population: men, women, Jews, Arabs and Christians. Israel's main exports are in the areas of technology, cut diamonds, and agricultural products. Despite limited natural resources, the country has developed its agricultural and industrial sectors immensely over the past twenty years ("Israel: Basic").

Israel may be small, but it boasts many unique achievements. Twenty-four percent of Israel's workforce holds a university degree. Apart from the United States, Israel has the most venture capital funds in the world. This nation also has the highest standard of living in the Middle East, with a per capita income of over \$17,000 in the year 2000. Israel possesses the second largest fleet of aircraft on earth, and has designed the airline industry's most impenetrable flight security system. It has the third highest rate of entrepreneurship in the world, and is very advanced in medicine and technology. The cellular phone was developed in Israel by Motorola, and the country has the most home computers per capita ("Interesting").

More than 90% of Israelis are urban dwellers. They live in housing constructed mainly of stone, concrete block, or stucco. Their nation is home to two unique types of agricultural communities, the kibbutz and the moshav, which developed as Jews from all over the world immigrated to the country. The kibbutz is a collective community in which the means of production are shared and each member's work benefits all. Kibbutzim were traditionally the backbone of Israeli agriculture. The second rural mutual arrangement is the moshav, where individually owned family farms cooperate in purchasing, marketing, and community services. These supply a great deal of Israel's farm produce ("Agriculture").

A typical farm family in Israel consists of a mother, a father, and three children. Compared to other industrialized countries, Israel's society is very family-oriented. The nation's small size permits relatives to live close together and have frequent personal contact. Holidays and events are generally celebrated with ceremonies, and relatives gather together to rejoice (Israel - Factors). The diet of Israelis consists of Jewish elements, and it also incorporates foods eaten in other Middle Eastern countries and the Mediterranean region. Falafel, a dish made of deep fried chickpeas, is very prevalent. Fresh fruits and vegetables are a staple in Israeli cuisine. In addition, hummus, pita bread, latkes, tabouleh, shawarma, and couscous are all widely consumed foods.

Education is greatly valued by the Israeli people. The literacy rate in Israel is 96.9% according to the United Nations. Students must attend school from the ages of three to eighteen ("Israel"). The nation has a compulsory national health care system which is primarily financed by the general public. Most Israelis are satisfied with their health care, and believe it comes at a reasonable cost (Kanon).

The average farm size in Israel is three to twenty acres. The type of crop grown depends on the location in which a given family resides. On the Mediterranean coastal plain, citrus fruits, avocados, and melons are customarily produced. Subtropical areas in the country yield bananas and dates, while apples, pears, and cherries are cultivated in the northern hills. Throughout the country, corn, wheat, grapes, and cotton are also raised. Sheep and cattle are the main livestock in Israel, with the majority of cattle used in the dairy industry (“Agriculture”).

Agriculture in Israel is a highly developed industry, in spite of the fact that the geography is not naturally conducive to cultivating crops. Thus, the success of Israeli farmers is a testament to their determination and drive to succeed. More than half of Israel’s total area consists of desert. Water shortage is a major problem, and the southern region of the country receives a mere two inches of rain annually. Agricultural workers only make up 3.7% of the workforce, but Israel produces 95% of the food required to sustain its own population. The area of irrigated farmland has increased from 74,000 acres in 1946 to 460,000 acres today. Field crops grown in Israel include wheat, sorghum, and corn. Common fruits and vegetables produced are avocados, citrus fruits, bananas, pears, cucumbers, and zucchini. Local cows produce the highest amounts of milk per animal in the world according to data published in 2011 by the Israel Central Bureau of Statistics. All of Israel’s milk originates from dairy farms within the country (“Agriculture”).

Since Israel’s establishment, it has become a world leader in agricultural technology and water management. For example, Israeli agriculturalists developed revolutionary drip irrigation systems which provide massive savings in water consumption. In addition, Israel has formulated advanced water management and treatment practices. Today, 44% of the water used for agriculture in Israel is recycled or low quality water. These advances help to increase crop yields, which are more important than ever due to rising food prices. Israel has undertaken numerous projects in developing countries to export its technologies (“Agriculture”).

Merely 20% of Israel’s total area is naturally arable. High crop yields are crucial since there is so little farmland available. Most of Israel’s crops are irrigated because of the dry desert climate, and water is an exceedingly valuable resource. The aforementioned drip irrigation system allows for precise water application combined with fertilizer application, earning the title “fertigation.” This technique saves money for farmers, and allows recycled or saline water to be used efficiently. Saline water, which is found throughout the arid land, can be used to irrigate tolerant crops such as tomatoes, melons, wheat, cotton, asparagus, dates, grapes and olives (“Agriculture”).

Another difficulty faced by Israeli farmers is heat stress. Heat stress is caused by raising dairy cattle under the extreme temperatures of the desert, and it adversely affects milk production. Various measures such as ventilation and humidifiers were developed and successfully introduced into the milk production industry to alleviate heat stress and increase milk production. The technology of using chicken manure for cattle nutrition is also widely utilized. Artificial insemination is common in dairy herd management, and the use of genetic technology is partially responsible for the high milk yields in Israel (“Agriculture”).

Israel suffers from a chronic lack of water. This is a significant issue because water is a vital resource that ensures the population’s well-being and preserves the agricultural sector. For years, there has been a persistent water shortage, but the situation has recently developed into a crisis. The causes of this predicament are both natural and man-made. Israel has had several unbroken years of drought, and population growth has led to an increased demand for water. Due to the shortage, less water is allocated for agriculture, thus reducing productivity. The necessity to ration water led to the enactment of the Water Law in the 1950s. The Water Law did away with private ownership of water resources and established a means of water allocation that is designed to be beneficial to resources and consumers (“Israel’s Water”).

Section one of the Water Law clearly declares:

“The water resources of the State are public property; they are subject to the control of the State and are destined for the requirements of its inhabitants and for the development of the country.”

Although water is a public resource, every person has the right to utilize water for recognized purposes. The water allocation for agriculture makes a distinction between private agriculture and planned agriculture. Water distribution for planned settlements was determined according to the type of soil, water production methods, and the number of homes in the community. Since 1986, the Israeli Water Commission has been following a policy of cutbacks in water rations. Cutbacks were made in most parts of the country in response to the coastal aquifer undergoing a rehabilitation process (“Israel’s Water”).

The year 2009 signified Israel’s fifth consecutive year of less than average rainfall. The disastrous consequences are clearly visible in Israel’s water supply. In the Sea of Galilee, water levels are quickly dipping below the point at which lasting damage will be caused to the precious water source. There is no denying the fact that Israel is facing its worst water crisis ever. Without an especially good year of rainfall, this predicament is likely to continue until 2013, when more desalination plants will be operational. The natural refilling of the aquifers from rainfall has been hindered by increased water demand, overuse of renewable water sources, rising urban development, and pollution caused by industry and agriculture. The Water Authority reports that the supply of fresh water in 2008 reached an all-time low of 725 million cubic meters, while demand reached 1400 million cubic meters. Recognition of Israel’s water scarcity problem has led policy makers to introduce regulations, standards, administrative tools, and economic incentives to the water sector to make it more efficient. Water constraints have led to the development of advanced technologies for water desalination based on reverse osmosis, wastewater treatment producing recycled water for irrigation, efficient water use based on drip irrigation, and filtration of surface water (“Tackling”).

According to the World Health Organization, water scarcity occurs even in areas where there is plenty of rainfall or freshwater. How water is used and the quality of the water available can determine if there is enough to meet the demands of households, farms, industry, and the environment. Water scarcity affects one in three people on every continent of the globe. The situation is getting worse as a result of population growth, urbanization, and increases in household and industrial uses. Water scarcity forces people to rely on unsafe sources of drinking water. It also prevents them from bathing or cleaning their homes properly. Poor water quality can increase the chance of acquiring diseases such as cholera, typhoid fever, and dysentery. Water scarcity encourages people to store water in their homes. This can increase the risk of household water contamination and provide breeding grounds for mosquitoes, which can carry disease (“10”).

Several issues that could affect water scarcity in Israel are population growth, urbanization, pollution, and energy demand. Population growth is a major factor because more people in an area require additional water. In the decades ahead, it would not be advantageous for the population to increase. Israel is already having difficulties providing water to its citizens. Also, 90% of Israelis presently reside in cities, and even more urbanization would harm the agricultural industry. Farms are essential to supply food for the public. Managing pollution is critical to minimize environmental and social impact, and water is also required to produce energy. Keith Schneider is a member of Circle of Blue, a network of journalists and scientists dedicated to water sustainability (Boaz). He spoke to a panel in Washington about the water crisis:

"It is not just that energy production could not occur without using vast amounts of water. It's also that it's occurring in the era of climate change, population growth and steadily increasing demand for energy. The result is that the competition for water at every stage of the mining, processing, production, shipping and use of energy is growing fiercer, more complex and much more difficult to resolve."

The seventh Millennium Development Goal focuses on ensuring environmental stability. Part of this goal deals with providing safe water to people around the world. Israel must have dependable water sources to maintain the well-being of its citizens. The implementation of a wide range of water-preserving activities could save Israel up to 370 million cubic meters of water per year. These include water-wise gardening, seawater desalination, and reduction of leaks in pipelines. If every Israeli strived to reduce the amount of water he or she used in a year, the country would benefit immensely (“Tackling”).

The Global Water Partnership is striving to create a water secure world. They have identified several aspects of water management that would benefit countries like Israel. The first step is to allocate water. Israel has already put a water allocation program into practice with the implementation of the Water Law. Stakeholder participation is another initiative that takes into account the best interests of society and the environment while preserving water. Pollution control and monitoring of water usage will assist Israel in maintaining dependable sources, as well. Continuing economic, financial, and information management is the final piece in the water security puzzle (“Water”).

In conclusion, Israel has made enormous strides as a country during the past few decades. It has become a technologically advanced, competent country. However, severe drought and an ever-growing population are draining Israel’s precious water supply, necessitating urgent measures. The drip irrigation and fertilization system has worked wonders for agriculture while conserving water. Using recycled and saline water also contributes, as did the implementation of the Water Law. Today, Israel is increasingly determined to reduce the gap between supply and demand. The solutions that the country is developing will benefit not only Israel but countries worldwide. As Thomas Fuller wisely observed in 1732, and Israelis likely maintain, “We never know the worth of water until the well is dry.”

Works Cited

- "10 Facts about Water Scarcity." *Who.int*. World Health Organization. Web. Mar. 2009. 12 Sept. 2011. <<http://www.who.int/features/factfiles/water/en/>>.
- "Agriculture in Israel." *Wikipedia.org*. Web. 12 Sept. 2011. <http://en.wikipedia.org/wiki/Agriculture_in_Israel>.
- Boaz, Peter, and Matthew O. Berger. "Rising Energy Demand Hits Water Scarcity 'Choke Point.'" *Commondreams.org*. 23 Sept. 2010. Web. 12 Sept. 2011. <<http://www.commondreams.org/headline/2010/09/23-3>>.
- "Interesting Facts about Israel." *Jfns.org*. Jewish Federation of the North Shore. Web. 13 Sept. 2011. <<http://www.jfns.org/page.aspx?id=43769>>.
- "Israel: Basic Facts." *Jrcrstl.org*. Web. 13 Sept. 2011. <<http://www.jrcrstl.org/documents/basicfacts.pdf>>.
- "Israel - Factors Affecting the Israeli Family, Family Patterns, Public Support for Families." *Family.jrank.org*. Web. 13 Sept. 2011. <<http://family.jrank.org/pages/977/Israel.html>>.
- "Israel." *Wikipedia.org*. Web. 13 Sept. 2011. <<http://en.wikipedia.org/wiki/Israel>>.
- "Israel's Water Economy." *Mfa.gov.il*. Israel Ministry of Foreign Affairs. Web. 10 Aug. 2002. 14 Sept. 2011. <http://www.mfa.gov.il/mfa/mfaarchive/2000_2009/2002/8/israel-s%20water%20economy%20-%20thinking%20of%20future%20genera>.
- Kanon, Sharon. "Learning from Israel about Healthcare." *Israel21c.org*. 28 Apr. 2010. Web. 14 Sept. 2011. <<http://www.israel21c.org/health/learning-from-israel-about-healthcare>>.
- "Tackling Israel's Water Crisis." *Sviva.gov.il*. Web. 14 Sept. 2011. <http://www.sviva.gov.il/Environment/Static/Binaries/ModulKvatzim/4Water-Bulletin35-WEB_1.pdf>.
- "Water Resources Management." *Gwp.org*. Global Water Partnership. Web. 14 Sept. 2011. <<http://www.gwp.org/The-Challenge/Water-resources-management/>>.