Environmental Issues in Israel

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Located on a landbridge between Africa and the Middle East, Israel is a small country with a unique environmental landscape and a wide range of climates and ecosystems. Within the span of just a few hours, it is possible to drive from the lowest point on earth, where you can swim in the Dead Sea, to the top of Mt. Hermon, where you can go skiing.

Before the creation of the State of Israel, the land was mostly empty and barren. The population density was low. In the last 60 years, Israel has transformed into one of the most densely populated countries on earth.

Israel has been side-tracked by rapid development, consecutive wars, and civil unrest, which have led to wanton use of scare resources and full-scale environmental destruction. With so many people fighting over ownership of the land, very few of the players have actually made the protection of the land itself a priority. Although many people are concerned about the existential threat to Israel, many overlook the very real threat to the health of Israeli citizens by environmental hazards. Recent research has shown that the number of deaths per year from environmental-related illnesses—including respiratory diseases, cardiovascular diseases, and cancer—is in the thousands.

It is easy to get depressed when working in the environmental field here in Israel. There are so many problems, and environmental issues are generally not taken seriously. The ramifications of ignoring environmental issues are dire—they include health problems, energy shortages, and water shortages. Israel is on the brink of numerous disasters. That said, I am not worried about Israel at all. For better or worse, Israelis thrive on emergencies. Long-term planning is basically non-existent. Israelis fly by the seat of their pants—and one way or another, they generally end up on top. That is why, faced with the unmitigated environmental mess that Israel has right now, I have hope. The challenge will not be whether or not Israel can handle the challenge; it will be proving to the government and the average

Israeli that the threat is real, imminent, and requires immediate action.

Israel is a small country with few natural resources but enormous scientific, engineering, and academic resources. The miracle of this country is that the threats that I am writing about today can be a thing of the past in just a few years. Israel already has within its borders enough ingenuity to transform its environment from one on the brink of disaster to a light unto the nations (based on renewable energy, of course).

Although creating solutions to environmental problems is initially costly and challenging, the reward is also very high. Not only will such solutions create a healthier population and ecosystem; but due to the demand for new technologies to solve the global environmental crisis, they will lead to enduring economic prosperity.

Israel is already a world leader in the new field of clean technology. But like Israel's best fruits, the best technology is being exported to other countries. This is not the fault of the companies themselves, many of which would like to see their technologies adopted regardless of any profit. Unfortunately they cannot overcome the bureaucratic barriers in place by government agencies that do not recognize the importance or potential of adopting clean technology into their infrastructure.

Industry and economic prosperity are no longer at odds with environmental protection. The systematic solution to Israel's problems is the creation of a thriving industry in clean technology.

In this article, I will outline Israel's basic environmental challenges and potential solutions. I will also introduce readers to new concepts of Israeli ingenuity that can lead to dramatic differences in the Israeli ecosystem over the next few years. Because Israel is an ecosystem, all things are connected; so too, in this article each section is connected to the other. I have broken the article into topics of water, air quality, transportation, and energy. Each of these subjects overlaps with the others. It is impossible to separate pollution from poor public transportation and air quality in general; but for the purpose of coherency, I will try to tackle each topic one at a time.

There are two very different schools of thought that are currently emerging into today's Israeli environmental movement: the "old school" of traditional conservationists versus the new clean technology field. While they should not be at odds, they have yet to join together. Traditional conservationists focus mainly on protecting resources, preventing development, and acting as a regulatory force for industrial development. Clean technology is a term that has developed over the last five years to describe new technologies that produce solutions for environmental problems—specifically in the areas of energy, transportation, and water.

Water

Water is Israel's most pressing environmental challenge—and is indeed the area where Israel has made the most progress. The barren landscape provides very few natural water resources, and the explosions of industry and population have led to a major drain on the sparse water resources that already exist. It would not be an exaggeration to say that Israel's water situation is dire and that the future of the country (and some say the future of peace in the Middle East) is dependent on the management of this precious resource.

The mighty Jordan river has been reduced to a trickle, and many of Israel's other rivers have either dried up or become contaminated by industrial discharge, sewage, and agricultural pollutants such as pesticides and fertilizer. Due to five years of low rainfall, Israel is in the midst of a draught. The

Kinneret, Israel's only freshwater lake, consistently sinks below the minimum level that it needs to maintain its integrity without turning into a swamp; and even the Dead Sea is reaching record lows and is at risk of drying up completely. Most drinking water comes from coastal and mountain aquifers, which are quickly being drained or polluted. Demand and consumption have been increasing steadily, and supplies are dwindling.

Israelis have worked to improve the water economy in numerous ways—desalinization, water-saving technologies, extensive use of recycled water, purification systems for aquifers and fresh water systems, and the institution and enforcement of stricter regulation. The government has set up a new tax that gives all residents an allotment of water per month for a reasonable price. Those who go over this amount pay a hefty fee, which rises proportionally to the amount of water used, with people who use the most paying more per cubic meter. This policy has just been put into place, and it remains to be seen what the effect will be. Officials are optimistic.

Although Israel has been developing these technologies for domestic use, the technologies are proving to be groundbreaking in both innovation and application. Oceans cover 70 percent of the world's surface and constitute 97 percent of the world's water. Of the 3 percent of the world's fresh water, an estimated 70 percent is contained in the polar ice caps and is not available for human consumption—leaving only approximately 1 percent of the world's water available for human use. Until recently, fresh water has been considered to be a finite resource; but Israel is proving that this is not the case. Israel has developed and implemented the process of desalinization, which extracts fresh water from ocean water. This is a major innovation. By the end of 2009, desalinization will produce about 40 percent of the country's domestic consumption; this is expected to rise to 80 percent by 2014.

International agencies are now seeking Israeli solutions for help to solve the global freshwater shortage. It is estimated that there are more than 1 billion people worldwide who do not have access to clean water on a regular basis. The World Health Organization claims that poor drinking water and inadequate sanitation claim the lives of approximately 5 million people per year due to water- related health issues, including dysentery, schistosomiasis, trachoma, or infestation with ascaris, guinea worm, or hookworm.

Water security is one of Israel's chief concerns and the environmental issue that Israel is most successfully tackling. Israel's commitment to ensuring clean water availability for the future will not only help the population of the country but also, it seems, will help people around the world.

Air Quality

Air quality represents one of Israel's the most immediate health concerns and is often called an "invisible killer." It is one of the most serious problems—but also one of the easiest environmental problems to solve. Air flows from one region to the next, and there is no need to actually clean the air; simply stopping to pollute it will fix the problem. Air pollution is easy to pinpoint and must be dealt with at its source. Emission standards, which are set and enforced by the government, are the most important aspect of any clean-air initiative. At this point, Israel's official standards are good, but they are poorly enforced; in many cities, pollutant levels are approximately 65 percent above the levels set by the World Health Organization.

Israel's air quality is measured by a national network that has over 2,000 stations throughout the country. There are various problems, depending on the region. Most air pollution is created by transportation, energy production, and industry, and these have all increased dramatically over the last

few years. The number of vehicles in Israel has almost doubled within the last ten years, as has electricity consumption. The major air pollutants are particle matter, nitrous oxides, ozone, hydrocarbons, carbon monoxide, sulfur dioxide, carbon dioxide, and lead.

Air pollution in Israel is aggravated by its very own landscape. The small land area, arid climate, lack of rain, and coastal industries near densely populated communities create increasingly poor air quality. Haifa Bay is one of the hardest-hit areas, as it combines intense industrial activity with difficult atmospheric dispersion conditions caused by the Mediterranean Sea and the topography of Mount Carmel. This leads to high levels of pollutants that are not easily dispersed. Despite efforts over the years to reduce air pollution levels, they have been mostly unsuccessful. A new approach is being implemented that will now focus more on emission standards as opposed to ambient toxin levels in hopes of regulating the creation of the problem.

There are a number of simple and effective solutions that Israel can put in place to preserve air quality. One of the most important is to regulate industry. Tight controls on emissions from factories will reduce the amount of toxic chemicals released into the atmosphere.

Another problem, which has social implications, is the uncontrolled burning of garbage. Pound for pound, an uncontrolled fire can produce thousands of times more toxins into the atmosphere than a high-temperature incinerator. Garbage burning is particularly commonplace in Arab areas. This leads to extremely bad air quality in the villages and contributes to air pollution in general leading to significant health problems for the entire population.

Transportation is another major cause of air pollution. It is effective to set higher standards on car emissions, but that is not the ideal. The ideal is to get combustion engine vehicles off the road by switching to public transportation that is environmentally sustainable, such as light rails and trains. For those who want to continue to own their own car but lower their carbon footprint, Israel is introducing a network for electric cars that will be online in the next few years. This will be discussed in greater detail in the transportation section of this article.

Finally, energy production, which will also be discussed in more detail, is a major air pollutant. Coal-burning plants and fossil fuels are the main sources of air pollution spreading poisonous gases into the air. As with transportation, regulation of emissions on the current use of energy production is helpful; but the ideal is to switch energy production to new, cleaner resources such as solar, wind, and water power.

Transportation

Israel has become an increasingly mobile society. It is not uncommon for Israelis to make long commutes, travelling from one city to the next—and at times, from one side of the country to the other—for work. In the early years of the State, public transportation was a priority, and many people relied on Egged, the national bus company, to get from place to place; but this is no longer the case. Public transportation lacks funding, and many bureaucrats have been following the poor example set by the United States of building more roads as opposed to light rails and trains, which are common in Europe.

The majority of Israelis still travel by public transportation, primarily on buses. Egged is still the largest bus company, but it is not as ubiquitous as it once was. Despite the rise in people's mobility and their need for transportation, there has not been a significant rise in the number of buses since the 1980s. Private cars in Israel used to be seen as a luxury item, but due to rapid economic growth and

poor government planning, many Israelis now need private cars because they lack alternative means of transportation. High gas prices and associated costs make owning a car extremely expensive; and it is not unheard of for people to spend up to one third of their monthly salary on a car and its associated costs. In 1960 there were 70,000 vehicles in Israel, and the vehicle density was ten cars for every kilometer of road. Today there are an estimated 2.1 million cars on the road, and the vehicle density has risen to an average of 120 cars per kilometer.

A prime example of this is the Modi'in area (between Jerusalem and Tel Aviv), which is touted as being one of the best planned cities in the country. Modi'in has been developed primarily over the past ten years, and the city is still under construction. The only public transportation is an inadequate bus system that does not connect to any of the outlying areas. In the center of Modi'in, there is a train station that connects to almost every major city in the country. Unfortunately, most bus lines do not stop at the train station, and surrounding villages have almost no access by public transportation at all. Extensive research has shown that for intercity public transportation to work there must be intracity public transportation as well. If people cannot easily travel from the train to their final destination, they will not take the train. This unfortunately leaves Modi'in with a beautiful new station and relatively few passengers.

Although public transportation is generally considered the ideal for environmental preservation, there are cleaner options for private transportation than the existing combustion engine car. Israel is about to become the first country in the world to have in place a national network of electric cars and charging stations. In a study done in 2009 (by Project Better Place), 57 percent of Israelis reported that they would make their next car purchase an electric vehicle if given the option.

Project Better Place is a private company based in Israel, with branches in the United States, Australia, Denmark, Canada, and Japan. They are the world's leading electric vehicle (EV) services provider, and they have already begun work on a series of charging stations throughout Israel. They have signed contracts with all of Israel's major malls, with train stations, and with Jerusalem's Mayor Nir Barkat, who will place charging stations throughout the city of Jerusalem for a pilot project starting this year.

Israel is currently the world leader in electric vehicle adoption, and it will be interesting to see how this develops in the near future. Electric cars are cleaner and better for the environment than gas guzzling combustion engines, but it begs the question: Where is Israel going to get the electricity to meet the country's transportation needs?

Energy

As Israel develops technologically and the standard of living rises, its energy needs are also rising. From cars to air conditioners, Israelis are becoming used to amenities that were almost unheard of just a few years ago. This has led to electric blackouts in the summers when energy needs are highest, and is setting up a future energy crisis where Israel will not be able to meet the needs. Energy experts agree that Israel lacks the proper infrastructure to meet the growing demands. Immediate measures need to be taken to ensure the energy supply.

Israel is, unfortunately, dependent on fossil fuels for the production of electricity; but since it has no natural resources of fossil fuels, it has to depend mainly on long-term contracts with countries including Mexico, Norway, the United Kingdom, and Australia for oil. Israel is one of the only countries that has a power grid that is not connected to that of any other nation—making Israel into a virtual electric island. For security reasons, it is vital that Israel secure its power production. Due to the animosity of surrounding countries, Israel has no access to the copious amounts of oil from neighboring oil-rich nations. Because of that, Israel relies on coal, imported mainly from South Africa,

for its electric power generating plants.

Coal is an extremely dirty source of fuel, creating hundreds of thousands of tons of ash per year. Burning coal releases mercury, selenium, boron, and dioxins, which are extremely dangerous, and the process also contributes to global warming by emitting carbon dioxide and methane (greenhouse gases). Burning coal also creates acid rain, which has harmful effects on plants, aquatic animals, and infrastructure. Environmental Minister Gilad Erdan has recently campaigned against the proposed coal power plant, which would increase existing emissions by more than 10 percent.

Last year, natural gas was found off the coast of Haifa, and plans are being made to use this resource for energy production. Although this could keep Israel running with its existing infrastructure, it will someday run out and leave the country in the same situation that it is in today.

New polices and alternative energy can help boost the level of energy available. A more intelligent use of existing resources can also help to avert the pending environmental crisis. This can be done by encouraging the use of energy-efficient appliances, doing things as simple as turning off lights in rooms that are not in use, and being selective about the use of air conditioners in the heat of summer. Simple actions such as planting trees can cut a house's energy usage by 15 percent due to the shade. Saving energy can be more effective than finding new (even "green”) ways to produce it.

Most important, Israel needs to change its source of energy to renewable sources such as solar, wind, wave, and bio fuels. Israeli companies are leading the way in technological innovation, but this innovation is being applied mainly in other countries. Prime Minister Netanyahu has claimed that the country is on a path toward energy independence, and Environmental Minister Gilad Erdan has expressed a commitment to following through on that claim.

Although it is a step in the right direction that the government has begun to see energy independence as a vital goal, it will be interesting to see how this will play out on the ground. As of now, there has been little progress to move this agenda forward.

Conclusion

Despite Israel's leap into the "first world" in regard to standards of living, Israel is still very much a third-world nation. Rampant pollution, poor resource management, and a government that has not taken environmental issues seriously have led Israel to the brink of major ecological crisis. Israeli citizens are paying the price for this with both their health and their financial resources. Israel can no longer afford to see the environment as an issue for the future; it must realize that now is the time to act.

The combination of lack of natural resources and political isolation has created the necessity for Israel to take its place as a world leader in clean technology and to lead by example. It is not enough for Israeli scientists and engineers to create companies for the Nasdaq. They must see their work in action, protecting both the environment in Israel and Israel's political interests.

The future of protecting the Israeli environment is a partnership between government, industry, clean-technology companies, and environmental protection agencies. Natural resources are finite, but renewable resources are not. The wind and the sun, plants and waves will continue to create energy long after the last oil mine has been tapped. If Israel chooses, it can lead the way not just in technology but also by example, creating a cleaner and better environment for its citizens and for the world.