

An Imperiled Promised Land

The Antecedents of Israel's Environmental Crises and Prospects for Progress

ALON TAL*

ABSTRACT

Israel's rapid economic development has had a steep environmental price. Despite remarkable achievements in such areas as solar heating, waste water reuse and reclamation of desert lands, most environmental indicators throughout this small country reveal rapid deterioration. Degradation of water and air quality is severe and issues such as solid waste management, preservation of open spaces and pesticide usage require immediate national attention and resources. Beyond the physical causes of these problems, the article identifies the historical and cultural origins of Israel's ecological crises. A number of events converged during the 1990s, including the creation of an environmental Ministry, to produce a new era for the country's environmental movement and an attendant sense of optimism. The article proposes a number of fundamental revisions in public policy in such diverse areas as public transportation population policy, consolidation of ministerial authorities and environmental education that are necessary to move the country onto a sustainable route.

I. Introduction: Israel's Environmental Crises

THE MIRACULOUS REDEMPTION of a "barren" land has always been touted as one of Israel's most impressive achievements. Ecological criteria and environmental data, nevertheless, present a far less complimentary picture of stewardship during the third Jewish Commonwealth. Since Israel's establishment in 1948, there have indeed been notable achievements in such diverse areas as water conservation, forestry, solar energy and anti-desertification (Israel Ministry of Environment, 1992). Yet, when viewed in a broader environmental context, the first century of Zionist settlement can primarily be characterized as a non-sustainable gallop towards ecological disaster.

* The Arava Institute for Environmental Studies, Kibbutz Ketura-D.N. Eilat 88040, Israel.

Although a small country with a total land area of 20,000 square kilometers, Israel is blessed with a geographic and biological diversity that more than matches its spiritual and historical dimensions. The southern half of the country, which is a desert region with rainfall limited to 20 to 250 mm of water annually, is a completely different landscape from the tropical and alpine environments in the north. The "Rift Valley" that dominates the eastern side of the country for 400 kilometers, encompasses the world's lowest point at the Dead Sea and offers a dramatic contrast to the limestone mountains of the Galilee in the north and the central Judean Hills. The rich landscape supports a remarkable biodiversity including 2,500 plant types (150 of which are indigenous to Israel), 350 bird species, 70 mammals and 88 reptiles/amphibians (Gabai, 1995).

Because of Israel's diminutive size, it did not take long for the full force of environmental degradation to be felt. Beginning in the 1970s, emission of most conventional air pollutants doubles every ten years, largely due to the burgeoning fleet of automobiles. The number of "exceedances" from national ambient standards has increased accordingly. During the years 1994-96, an average of 300 violations of air quality standards occurred in the Tel Aviv area alone (Israel Central Bureau of Statistics, 1995).

By 1993, Hebrew University Professor Menahem Luria, a leading expert in air quality monitoring, estimated that air pollution in Jerusalem would exceed present levels in Mexico City by the year 2010 (Luria, 1994). According to estimates of Professor Noam Gavrielli of the Technion University Medical School in Haifa, particulate emissions, only one of many problematic Israeli air pollutants, are associated with 1000 deaths each year (Gavrielli, 1995).

The water flowing in most of the country's streams and rivers is predominantly poorly-treated, putrid municipal sewage. Groundwater has become so contaminated that vast parts of the nation's largest aquifer have been disqualified, even for agricultural usage. In 1992, 30-40 percent of the wells exhibited microbial contamination (Ministry of Environment, 1992). While eutrophication in Lake Kinneret (the Sea of Galilee), the country's only fresh water lake, appears to have been stemmed during the past two decades due to intensive government management activities (Berman, 1996), expanded tourism around the banks threatens the precarious equilibrium.

Green open spaces and undeveloped natural areas are being paved over to accommodate an increasingly consumerist society's appetite for automobiles, backyards and villas. The urban sprawl, once associated with the greater Tel Aviv region, stretches throughout the Central region, creating the so-called N'Ashdod (Netanya to Ashdod) coastal megalopolis. As suburban development moves eastward to the Judean Hills in Jerusalem, it devours much of Israel's natural beauty in its wake (Sagi, 1996).

There are other disturbing trends as well. Toxic and municipal solid waste is generated in growing amounts with no comprehensive policy for source reduction

or treatment. Pesticides are used almost indiscriminately with one of the highest per-hectare usage rates in the world (Richter, 1994). Some ten percent of produce contains pesticide residues in excess of national standards. Factories lying in the residential areas often store considerable quantities of hazardous chemicals with no meaningful emergency response plans in place.

Leading Israeli journalist and author Amos Canaan declared recently that "Jews have caused more damage to the Holyland during the last fifty years than that cumulatively produced by a litany of conquerors during the past two thousand." As this chapter will document, such a critical view is not without empirical support.

How did the Zionist adventure, springing from an ideology that adored the land of Israel, produce such degradation? The first part of the chapter offers a cursory environmental history of Israel from the time of its independence, tracing the origins of specific environmental problems to rapid industrialization, massive population growth and government policies. In the second section it is argued that a new era of environmentalism began to emerge at the end of the 1980s with the creation of an environmental ministry and enhanced public awareness. In the final section a discussion of the requisite policy and environmental paradigm shifts will focus on the primary ideological and practical challenges facing Israeli decision makers and society. Fundamental changes are imperative if the Jewish state is to embark on a more sustainable route and return a modicum of harmony between the inhabitants and the very land Zionists came to redeem.

II. The Origins of Israel's Environmental Crises

Development and the Zionist Imperative

While Zionist visionaries in Europe dreamed about what a Jewish State might be and argued about philosophical dogma, it was a practical, energetic generation that forged Israel's physical reality (Elon, 1971). The Zionist pioneers, largely a self-selected population, preferred tangible achievements to time consuming, thorough planning. It can be argued that a pragmatic myopia emerged as the dominant approach to national development during the period prior to Israel's independence, when "creating facts on the ground" constituted a political imperative. The so-called "Stockade and Tower" settlements, created overnight to circumvent British mandatory building restrictions, remain a symbol of the efficacy and orientation of the Zionist enterprise (Ben Gurion, 1955).

These pioneers frequently perceived the natural world as a challenging, hostile wilderness to be tamed through diligent Jewish settlement. Songs extolling production, the beauty of concrete and the importance of construction became part of a nationalistic liturgy. While Israeli Zionists were certainly not unaware of the

splendor of the land of Israel, the task of nation building dominated their senses (Odenheimer, 1991).

The pre-state Zionist community was also home to many figures who deviated from the dominant anthropocentric ideology, which deemed economic and political development to be paramount. The preaching of second Aliya philosopher, A.D. Gordon, as expressed in his seminal work "Man and Nature," offered a romantic and inspirational alternative (Gordon, 1951). Gordon waxed reflective about an organic rapport between the Jews and their land that would replace the Diaspora dissonance and alienation from the natural world and wrote of the edifying benefits of manual, agricultural labor. A complimentary, ecological voice can be found in the rich images penned by "Rachel", the lyrical, melancholy poet, who wrote on the banks of the Kineret Lake during the early third of this century (Blubstein, 1978). Yet their ideals, while widely admired, were never integrated into macro-decision making on physical planning and policy issues.

The almost exclusive focus of the Yishuv (The Jewish settlement in British Palestine) and later that of Israeli planners and politicians on economic and security exigencies ensured that even the most successful enterprises would give rise to severe environmental problems. Over-pumping in Tel Aviv during the 1930s and 40s led to closure of wells due to massive salt-water infiltration. The draining of the Hulah Swamp in the northern tip of Israel during the 1950s, once hailed as a visionary act of Zionist competency, today is largely considered ecological folly (Merom, 1960). Recently, a small area of the reclaimed but largely unproductive farmland was returned to wetlands.

A more recent example, the construction of Tel Aviv's Reading Dalid Power Plant in the 1960s (through a statutory circumvention of Israel's own planning law), reflects the prevailing development paradigm. The country's immediate energy needs were met with little thought to the sulfur and nitrogen dioxide levels in the surrounding metropolitan area (Laster, 1976). The prevailing, short-sighted impatience was exacerbated by a pervasive lack of national environmental consciousness. Basic concepts such as impact statements, emissions controls and endangered species were not part of the Hebrew scientific or conservational nomenclature for the first two-thirds of the twentieth century. In this sense, Israel was little different from many other western nations. But as a very small country, with minimal resources, its margin for error was, and remains perilously small.

Indeed, as long as Israel remained a sparsely populated, relatively indigent country, with an apparent surplus of basic resources, the effects of the aggressive development policy were not conspicuous. Yet, as the population grew almost tenfold between 1940 and 1996, so did the ecological damage (Ministry of Interior, 1992). The same aggressive Zionist ideology that, despite unrelenting security threats, galvanized a nation to transform swamps and deserts into a modern prosperous state left deep scars on the land of Israel.

Perhaps the single greatest cause of Israel's present environmental crises is the concomitant increase in population and rapid economic development (Brachya, 1996). Together, these place enormous pressures on Israel's limited and fragile resources. The symptoms emerged so rapidly that it has been difficult for decision makers to meet the challenges. When government decision-makers faced the constraints of limited national resources, hard, frequently politically unpopular decisions were required and rarely made.

It would be wrong to suggest that physical planning had no place during the initial years of statehood. A national Master Plan designed in 1950 by a team of planners headed by Arie Sharon (no relation to the general/politician of the same name), established the physical blueprint for the Israel of today. This twenty-year plan created such landmarks as the port of Ashdod, the National Water Carrier and most development towns. Yet, the strategies for national development had no mechanism for integrating environmental considerations. Moreover, the underlying orientation and consequent objectives created environmental impacts that eventually became intolerable (Mazor, 1994).

Beyond rapid economic growth to absorb immigration, population, demographic dispersal to guarantee Jewish sovereignty was one of the Sharon Plan's paramount objectives. Professor Adam Mazor, one of Israel's most distinguished experts in physical planning, has diagnosed the prevailing orientation of early planners as "agoraphobia," or a fear of open spaces. According to this view, the major objective of planners was to fill up the country's seemingly vast empty stretches. This manifested itself in strategies that sprayed dozens of new development towns and agricultural settlements across Israel's landscape and encouraged new immigrants (with only modest success) to settle in Israel's periphery. Even within Israeli cities, high-rise buildings were relatively rare.

Within the span of a few decades, Israel was transformed from a relatively unpopulated land to one of the industrialized world's most crowded countries. While in 1948 the legitimacy of scattered and dispersed construction may have been self-evident, Mazor argues that by the 1960s, several waves of immigration made this strategy inappropriate, given Israel's diminutive size (Mazor et al., 1995).

The resulting sprawl today is bemoaned by environmentalists as "the Los Angelesization" of Israel. The phenomenon has been exacerbated by an explosion of hasty development and construction during the early 1990s, exploiting an Emergency Planning Law (enacted to meet the mass immigration from the former Soviet Union) that circumvented normal approval procedures (Gouldman, 1996). The results have been profound. Mazor's recent contrast of aerial photographs between 1948 and 1993 suggest that the amount of land transformed from undeveloped or natural sites to urbanized construction increased from 3 to 17 percent.

Agriculture is another area where national policy was unable to envision the environmental ramifications of "success." The return of the "Jewish Farmer" and the greening of the desert, a central tenet of modern Zionism and modern Israeli policies, ultimately had grave ecological impacts. Heavy use of fertilizers, pesticides and waste water irrigation led to alarming deterioration in ground water quality (Mushkat, 1995).

While Israel's Water Commissioner is granted almost unrestricted authority to regulate and reduce pollution of water resources, historically, commissioners have done very little to reverse the ongoing contamination. Selected by the Minister of Agriculture, the political orientation of those holding the position has always been clear. Water prices, controlled by a powerful farm lobby (supported by their historically high representation in Israel's Knesset), reflect massive agricultural subsidies. Agriculture's share of the national water budget typically reached sixty percent (Schwartz, 1994).

As is frequently the case with subsidized commodities, water was frequently squandered, particularly by the farming sector. This often led to cases of "over-pumping" of underground aquifers and a subsequent increase in salinity levels. Until the State Comptroller issued a scathing report in 1990 castigating the irresponsible policies of the Water Commissioner (State Comptroller, 1990) however, no serious national debate about the wisdom of agriculture's water allocation occurred. Here again, deeply rooted national ideological commitments failed to accommodate the dramatic rise in population/pollution and a corresponding drop in available resources.

Present commitments to encourage access to automobiles as the primary form of transportation is yet another example of policy-makers' inability to bring old dogma in line with new ecological reality (Garb, 1996). Proactive measures to temper the impact of the geometric expansion of the domestic fleet from 70,000 vehicles in 1960 to roughly 1.5 million today were never seriously considered. Hence, the level of mass transit services deteriorated during this period, and the quality of gasoline often made the catalytic converters, that were only installed in cars during the early 1990s, largely ineffective (Tal, 1992). The associated congestion on Israeli roads, particularly during rush hours, and the pernicious air pollution levels have not yet registered with decision makers, who continue to reduce investment and subsidies for public transportation while dramatically expanding Israel's road network.

Of course the most fundamental conventional Israeli paradigm that requires rethinking in light of new ecological realities is a blind commitment to unfettered economic growth. Increasing GNP and productivity has been the *raison d'être* of Israel's economic policy since the country's establishment, regardless of the ruling political party. National policy assumes that the general welfare and happiness of citizens automatically improves as the economy expands. While strategies vary under Finance Ministers—from the early heavy industry emphasis of Sapir to the

more recent, high-tech models of Shochat and Merridor, the pursuit of speedy, high-return projects with little or no regard to long-term impacts on the environment is consistent. By the end of the 1980s, however, the damage wrought by expanded production and consumption on the quality of Israel's air, land and water could no longer be disregarded by decision makers with impunity.

Historically, within Israeli economic circles there has been little interest in alternative paradigms. The country's many influential artists and intellectuals, so vociferous on a range of societal issues, never seriously raised questions about the limited time horizons of economic planners or industrial and agricultural producers' propensity for destroying the very resources upon which they rely. Paradoxically, while the "polluter pays" ethic, prohibiting the taking of public resources for private economic gain, increasingly found expression in Israeli environmental statutes, implementation of such principals lagged drastically (Tal, 1994).

Hence, while international awareness following the 1972 Stockholm convention caused a ripple in Israeli society, and was followed by the promulgation of the first ambient air quality standards (Abatement of Nuisances Regulations, 1972) and tough new environmental amendments to the Water Law, 1972, (Adam Teva V'din, 1992), environmental controls, in practice, were rarely demanded from industries, particularly if they threatened short-term profits. Similarly, municipalities were not required to meet their legislative responsibility to treat sewage and dispose of garbage in a sanitary manner.

III. The Paradox of Israel's Environmental Movement

Despite the bleak picture described above, a strong environmental movement emerged in Israel during the country's first four decades (Sofer, 1991). Its efforts focused almost exclusively on nature preservation and conservation. In retrospect, it is not clear whether this narrow agenda was the result of superficial consciousness or tactical considerations (likelihood for success), given the political problems associated with tackling the powerful, vested economic interests that created the acute pollution problems. With very little environmental monitoring during this period, it may well have simply been due to a lack of understanding regarding the extent of deterioration.

Notwithstanding the inadequate attention directed towards pollution prevention, preservation efforts undertaken by the Israeli government agencies during this period are unquestionably impressive. A 1963 law established the Nature Reserves and National Park System, and it was promptly followed by an aggressive conservation plan, largely associated with the charismatic Avram Yoffe, who headed the Nature Reserves Authority. A former general, Yoffe shepherded "National Master Plan Number 8" for establishing nature reserves and parks through the bureaucracy of the Ministry of Interior. Commissioned in 1970 and submitted and approved in

1979 and 1982 respectively, the plan includes 278 sites (143 reserves and 78 parks) covering more than a million acres of land or a full quarter of the real estate lying inside pre-1967 Israel.

Numerous caveats must be mentioned when presenting Israel's Nature Reserve System (Gabai, 1995). Many of the reserves have yet to be formally declared and appear only as potential sites on the Master Plan drawing board. Other reserves are located inside firing zones and training grounds of the Israeli army, which is not duty bound by law to respect the Nature Reserve Authority. On a deeper level, it is often argued that due to centuries of human interaction with the environment and the diminutive size of the country and parks, it is practically impossible in Israel to set aside critical masses of land where nature is not only preserved, but can continue to evolve without anthropogenic disturbance.

Yet, the system of nature reserves and the attendant protection of hundreds of plants and animal species under the Nature Reserve Law's "Natural Assets Regulations" remains a very bright spot in the midst of the period's overall development fervor. The relatively few extinctions recorded this century (involving seven mammal species—including the bear and the cheetah, 14 birds—including the ostrich and field owl and two reptiles—including the crocodile) almost all predate the establishment of Israel.

Other quasi-government groups enjoyed comparable success in the area of nature conservation campaigns. The Jewish National Fund's (JNF) tree planting initiatives have led to the planting of 200,000,000 trees over hundreds of thousands of acres. Their activities received a significant boost with the recent passage of Master Plan Number 21, which will enable the JNF to double the forested lands in Israel in the future. The magnitude of the forestry activities is unprecedented internationally and a justifiable source of national pride.

Furthermore, the Society for Protection of Nature in Israel (SPNI), established in 1954, leveraged a national passion for hiking and outings to grow into the nation's largest non-government organization with thousands of members. Their highly successful educational campaign to eliminate the picking of wildflowers and expansive network of field schools is indicative of both their influence and limited focus during this period.

Ultimately, however, the national pollution problem was not addressed by either the government or the non-government sector. In the absence of an independent Environmental Ministry, limited regulatory efforts were centered at the Environmental Protection Service, established in 1973 and located for the most part in the Interior Ministry. Yet, lack of enforcement authorities and marginal influence within the Ministry placed formidable limitations on the activities of the Service's small but highly energetic professional staff.

Regulatory initiatives that did succeed (e.g., marine pollution prevention catalyzed by international efforts to protect the Mediterranean Sea) were never in re-

sponse to demands by a non-governmental "green" sector that remained largely indifferent to the pollution levels spiraling out of control. The environmental movement's orientation during the 1970s and 80s led a noted Israeli environmentalist to characterize the country's environmental movement as "standing on a toxic waste dump and watching the birds."

The paradox of Israeli environmentalism through the 1980s continues to puzzle many local commentators. On the one hand, an extensive network of nature reserves, parks and field schools nurtured a remarkable culture of hiking and retreats. On the other hand, unsustainable development and an industrial sector that was rarely required to internalize pollution control costs produced unhealthy, ambient pollution levels in the cities and a parallel massive deterioration of natural resources. Ironically, the watershed event that began the changes in Israel's environmental activities had little to do with the severity of the problem.

IV. The New Era of Israeli Environmentalism

Israel's attitude towards the environment underwent a drastic change during the 1990s. While this "greening" has not yet translated into broad-based environmental gains, the political climate is finally ripe for comprehensive, environmental regulations and fundamental changes in Israeli society's attitude towards responsible ecological living. While it is difficult to single out a particular event that has led to the transition, three phenomena that served to reinforce each other are identifiable:

- the creation of the Environmental Ministry;
- the expansion of environmental activism within the non-governmental sector; and
- a dramatic expansion of environmental education and media coverage.

The 1988 elections resulted in a stalemate requiring a national unity government containing both the Labor and Likud parties. Under the coalition agreement, the two adversaries were to have an equal number of cabinet ministers. Faced with an odd number of existing portfolios, a Ministry of Environment was created to provide a cabinet entree for the talented young Likud politician (and later Mayor of Tel Aviv) Ronni Miloh. Environmentalists were ecstatic at the promise of a single, cabinet-level entity, holding the requisite authorities to confront the full range of pollution problems. They were also relieved to discover that rumors about the creation of an alternative "Sports Ministry" were unfounded.

Once established, however, the Ministry got off to a shaky start. As a "low prestige Ministry," the office itself proved to be a turnstile for ambitious politicians. During its first seven years, the Ministry has seen five different administrators at its helm from five different political parties, leading to striking inconsistencies in policy. For instance, Minister of the Environment Ora Namir (1992-93) implicitly set solid waste as her top priority and was a fervent advocate of incineration. Her

successor, Yossi Sarid, became resigned to the inevitability of trash burial and to a lesser degree supported recycling, green labeling and reduced packaging. Rafal Eitan, the present Minister, appears to be channeling resources to litter control and has also voiced support of incineration proposals.

Other disappointments involve budget and statutory authorities. For its first three years, the Environmental Ministry's budget was a paltry 10 million dollars (ICBS, 1990). Even when this level of appropriations increased due to Minister Sarid's extensive efforts to present four-fold level, it was still inadequate to cover the costs of highly skilled personnel, monitoring equipment, media campaigns, significant policy research and assessment. Even more problematic is the lack of substantive authority. Many key environmental areas remain largely in the hands of other government ministries. Control of mobile air pollution sources remain within the purview of the Ministry of Transportation, and public transport is even more fragmented. Sewage treatment is funded by the Ministry of Interior and monitored by the Health Ministry. Radiation is largely regulated by the Prime Minister's office. As mentioned, enforcement of water quality laws is still primarily a matter in the hands of a Ministry of Agriculture appointee, the Water Commissioner (Tal, 1993).

Nonetheless, the creation of the Ministry provided a cabinet-level advocate for environmental interests. Minister Ronni Miloh's immediate battle to impose stiff emission standards on the Haifa Oil Refineries and Electric Company, despite competing litigation by both industry and environmentalists, resulted in a compromise leading to a drastic reduction in sulfur dioxide concentrations in the Haifa area (ICBS, 1995).

The Ministry has also begun the first criminal prosecutions of municipal authorities who do not meet environmental standards. While used only sparingly, high profile prosecutions such as the trial of Eilat Mayor Raffi Hochman for illegal sewage discharges into the Red Sea, signaled that the Ministry means business (Warburg, 1993).

At the same time, the environmental movement in Israel at both the national and local level began to stir. The public, suffering from what is increasingly perceived to be unreasonable exposures, wanted activities beyond nature appreciation. The creation and subsequent aggressive activities of Adam Teva V'din, the Israel Union for Environmental Defense, a national public interest law and science group, is indicative of the growing public militancy and professional demand for better compliance with environmental laws (Silver, 1994).

The burgeoning number of effective local groups is also impressive. According to a recent survey, over 80 environmental organizations have been active over the past decade; from Kiriyat Shmoneh to Eilat, citizens across the gamut of Israeli life organized to improve the quality of their immediate environment (Bar-David, Tal, 1996). Farmers in the Jezreel valley successfully stopped a sanitary landfill in a neighboring forest; residents of the Maccabim settlement in 1994 received a

Supreme Court order enjoining construction of part of the planned Modit'n city to protect sensitive archaeological areas; in 1990, Haifa's "Citizen's Against Air Pollution" coalition, prevented the expansion of the local power plant in the country's most polluted city. Even ultra-orthodox communities such as B'nei Brak, not traditionally associated with environmental activism, have undertaken campaigns to abate pollution from small businesses, culminating in a Supreme Court petition.

Environmental education in Israel has also entered the modern age. It has been pointed out that the nature awareness approach characterizing pedagogical efforts failed to produce a broad cadre of committed environmental lawyers, economists, scientists and activists. The new environmental curriculum is more promising. By the 1990s, numerous high schools began to offer special environmental tracks with a strong science emphasis, including the opportunity for testing in high school matriculation examinations. New advanced degree programs in environmental studies were established at the Technion, Tel Aviv, Ben Gurion, Haifa and Hebrew Universities; and most recently a special Middle East regional environmental program opened at the Arava Institute for Environmental Studies. These interdisciplinary programs, relatively anomalous within Israeli academia, are appropriate given the variegated nature of the subject matter.

Formal and informal environmental education also reached new levels during the 1993-94 "Year of the Environment." Public schools introduced a mandatory environmental component in the curriculum of each grade. A series of public campaigns including battery collection, introduction of a government sponsored "green seal" for environmentally friendly products, national beach cleanup and many independent initiatives by Youth Movements and communities complemented school-room theory (Ministry of Environment, 1995).

Moreover, national environmental awareness grew as a result of expanded media coverage. In 1989, only two national newspapers, HaAretz and the Jerusalem Post had a reporter working a part-time beat to cover environmental issues. By 1994, the environment had become a major media issue, with all dailies and periodicals earmarking staff to ensure scoops and provide ongoing coverage. Environmental topics and environmentalists began to make the television "talk show" circuit and received extensive attention on the new local cable stations. Clearly, Israel's savvy press had come to believe that the public was interested in the environmental story.

Despite the concern and enthusiasm generated by educational activities, little change has been registered in environmental indicators. Notwithstanding the high rainfalls during the past years and major reductions in agricultural allocation of water that returned much of the aquifers' water deficit, salinity levels in the coastal aquifer continue to rise precipitously. The number of air pollution episodes and exceedance of national standards also grew, at an even faster pace. Hazardous waste remains largely unaccounted for, and environmental regulation of pesticides is still rare. Environmentalists' future challenge involves harnessing the enhanced Israeli

ecological consciousness to prompt policy changes and better enforcement on the one hand, while galvanizing a heightened commitment to environmentally responsible individual conduct on the other.

V. The Demands for a Sustainable Future

Sustainability has emerged internationally as a key ecological concept that, while vague, generally encourages development that does not degrade basic environmental resources. This requires a move from a linear approach to production and natural resources to a cyclical one. Given the country's population growth and economic boom, such an approach is long overdue in Israel. Already, much damage is irreversible.

Flora and fauna supplanted by a proliferation of urban sprawl and agricultural development probably will never return. In a recent lecture, Director of Water Quality in Israel's Ministry of Environment, Yeshayahu Bay Or, declared the coastal aquifer (a reservoir that holds a full third of Israel's fresh water supply) to be "moribund." In his pessimistic view, because of the pollutants already present in the soil that have percolated towards the groundwater and because of the high pace of the salinization process, it is only a matter of time until the entire aquifer becomes unfit for human consumption as well as agricultural use.

Much remains that can be saved. The Nature Reserve authority's Hai Bar program that returns many of the 20 animal species that have become extinct locally to their natural habitats should serve as an inspiration. If Israel is going to have an inhabitable environment for future generations, ecology must adopt an aggressive pre-emptive and restorative approach—preventing pollution and repairing the land. The recent establishment of a Rivers Administration to reclaim Israel's polluted streams constitutes just this kind of initiative. In the final analysis, business as usual is no longer sustainable, and basic values, behavior and conventions must be altered dramatically. The following are some of the essential challenges that must be on Israel's environmental agenda.

Institutional Expansion

The Ministry of Environment as mentioned is not succeeding in concentrating key powers in its hands. Water pollution, arguably Israel's number one environmental priority, is an example of where the Ministry of Environment is relegated to a secondary supporting role. The Water Commissioner's authorities must be transferred from the Ministry of Agriculture to an alternative, more independent environmental Ministry. During the present tenure of Minister Rafael Eitan, who coincidentally holds both the environment and agriculture portfolios, such an institutional transition should be remarkably easy. Similar measures are needed in other problematic areas

such as pesticide registration and application. Progress cannot be expected without clear authority, wielded by a committed agency to regulate mobile source emission, radiation, mining and even the composition of petroleum products.

Environmental Planning

Israel must realize that as land becomes more scarce, it must be preserved with fanatical stinginess. In practice, this means a return from the hasty habits spawned by the Emergency Legislation of the 1990s, to the cautious and thoughtful planning process that Israel's Planning and Building Law mandates. The use of environmental impact statements needs to be expanded and should become an integral part of every major construction initiative, thus guaranteeing the public's right to know the full implications of a development project. Most important, particularly in undeveloped areas, Planning Committees must be willing to say no, even if this results in reduced tax revenues to local authorities or short-term forgone business opportunities.

Greater resources must go to expedite preservation of undeveloped lands, both for use by future generations as well as a critical mass of territory for sustaining ecologically viable food webs. A National Master Plan for preservation of open spaces should be quickly prepared to ensure that the most aesthetically and ecologically valuable lands remain unspoiled. Recommendations of Adam Mazor's long-range 2020 Program should be implemented with regards to greater efficiency in land use. This includes policies that discourage and limit development of single-story structures in the center and north of the country with corresponding incentives for construction and purchase of well-designed, attractive high-rise structures.

While new settlements have always been part of the Zionist package, it is time to freeze the map in its present state and meet population growth through expansion of existing towns. New settlements, particularly one and two-story suburban communities, serve to pave over development options for future generations. Finally, the Negev desert, a region where there is ample room for growth, should be the focus of environmentally sensitive development efforts, with Beer Sheva expanded to constitute the country's third and ultimately largest metropolis.

Public Transportation

In a country as small as Israel, there is insufficient space for a highway system that can accommodate the three million private vehicles that will serve the eight million people expected to live in Israel after the new millennium begins. Convenient, high speed public transportation is the only serious hope from both an ecological and traffic management/safety point of view. The pragmatic Israeli public will ultimately come to realize that only first-class trains and buses can break the gridlock in congested urban areas. They also offer the attendant benefits of curbing air pollution and preserving open spaces.

Existing incentives for private automobile ownership including import tax benefits for immigrants and salary perks for public servants and other employees should be replaced with public transportation subsidies. An emergency plan to implement "designated public transport lanes" should make traveling by bus faster than driving private cars. Parking freezes, additional fuel taxes, expanded pedestrian walkways, carpool incentives and bicycles lanes are solutions that must be considered, with regulation of automobile usage a last resort which may very likely become unavoidable. The remarkable success of the recently opened Rehovoth/Tel Aviv line, which without any advertising is flooded by pragmatic Israeli commuters, confounds the pessimistic conventional wisdom that Israelis are too addicted to their cars to travel by rail (Shilberg, 1996).

Enforcement

In most areas, Israel has environmental standards that are compatible with international criteria for protection of public health and welfare. For instance, the 1992 ambient air quality standards control more pollutants and are generally more stringent than the national Air Quality Criteria of the United States (Worchaizer, 1993). It is the widespread violations of these standards that serve as the primary challenge to policy makers.

Efficient and professional enforcement activities have proven successful in cleaning air and water around the world. Israel's marine pollution prevention efforts, as part of the national commitment to comply with the "Barcelona Convention" for protection of the Mediterranean, is the one area where an ongoing inspection and monitoring program has existed since the 1980s. It is therefore not coincidental that marine pollution is also the one environmental medium where pollution levels actually retreated during the 1980s. For example, tar along Israel's beaches has dropped by over 1000 percent in the period following 1975... (Whitman, 1988).

In order for enforcement efforts to be credible, however, the Attorney General and the District Attorney's offices must make prosecutions a priority. The Ministry of Environment has received authorization to prosecute violators of several environmental laws, and has hired a few private law officers on a "retainer" basis to file cases on its behalf. Yet, the number of prosecutions is marginal relative to the pervasiveness of the violations (Ministry of Environment, 1996).

A strong inspection program requires uncompromising political backing, as it inevitably leads to conflict with powerful business interest. Enforcement personnel at all levels must be ready to implement a societal decision to prefer quality of life and protection of natural resources over short-term economic profits. Israel's many environmental laws express a general legislative intent to deal rigorously with polluters, but this is not reflected in the priorities of the State or District Attorney's offices. There has always been in Israel unquestionable support for Jewish and human

values. There must be similar support by the public for bold environmental actions, if the political equation regarding pollution is to be changed and environmental objectives attained.

In theory, it can be argued that Israeli environmental policies should begin to integrate economic incentives for non-polluting behavior—adding the proverbial carrot to the regulatory stick. Yet, for this theory to be compelling, certain conditions must be met. First and foremost, precise data must be available. Without accurate information about what is coming out of smoke stacks and the chemical make-up of effluents discharged by a factory into a sewage system, it is impossible to know whether a trade or tax incentive has actually helped the environment.

Experience from around the world has led to a consensus that economic incentive programs require no less supervision and enforcement than conventional “command and control” policies. In Israel, basic information and enforcement capabilities in the field are still woefully lacking. A freedom-of-information law still languishes in the Knesset, leaving the public without access to many key environmental data sets. Hence, enforcing existing Israeli standards should be seen as a prerequisite before attempting innovative pollution reduction strategies.

Population Policy

Meeting the environmental challenge honestly may call some of the fundamental beliefs of Israeli society into question. Israel’s commitment to expanding its Jewish population is a so-called “sacred cow” and constitutes a public policy nonnegotiable. There are many reasons for this dynamic, including residual trauma from anti-Semitic persecution and a sense of isolation and vulnerability when faced with the hostility of the entire Arab world. Yet, when seen in a European context, the picture is very different. Today the population of Israel approaches that of Switzerland and more people speak Hebrew than Norwegian.

After fifty years of population growth at roughly one million people per decade, Israel needs to reconsider its demographic policies. While the in-gathering of the Jewish exiles will remain the *raison d’être* of the country, with an open immigration policy a central tenet of mainstream ideology, it is not certain that ongoing subsidies to large families make sense. While the birth rate is dropping, it remains among the highest in the Western world, despite Israel’s diminutive geographic size. In the long-run, continued demographic expansion spells ecological and probably economic disaster. Sooner or later, the issue will have to be confronted—better sooner than later.

Education and Environmental Values

As the State of Israel enters the second half of its first century, its pollution profile has changed. No longer can the industrial corporate world be vilified as the

primary environmental enemy that must be unconditionally vanquished for total ecological victory. In fact, contamination is increasingly caused by hundreds of small polluters and the seemingly banal activities of an anonymous, dispersed population. Agriculture, automobiles, sewage treatment, dry cleaners and private home developers are at the heart of Israel’s environmental crises. If Israelis seek an environmental enemy on whom to pin their ecological distress, increasingly “it is us.” In such a context, an effective strategy for Israel’s environmental movement must go beyond symptoms to the cause of the maladies.

When so many actors are responsible for environmental problems, command and control regulation may not offer the most efficacious control strategy, unless it enjoys broad-based voluntary support from the public. The current educational focus on ecological awareness must be expanded to demand individual participation—from energy conservation to consumption patterns and environmentally-friendly shopping. Modern Israel has increasingly come to adopt western values. Many values, such as respect for human rights and free access to information, are ecologically neutral or even positive. Yet, the growing materialism and emergence of a consumer society has created a glut of solid waste, short-term economic plans and irresponsible polluting behavior.

Polluters are ultimately tolerated because society identifies with their singular pursuit of profits at the expense of public values and quality of life. Even though they may be responsible for criminally high levels of pollution, they are not treated as criminals. To enter a sustainable era, Israel must rethink its commitment to conventional, quantitative economic measurements of success.

While no Israeli citizen should be denied a minimal level of comfort, prosperity should not be confused with greed. In an age where emigration from Israel is an option available to many Israelis, the decision to live in the Jewish State is largely a matter of choice. For most citizens, a higher quality of life offers a sufficiently compelling reason to remain and build a country, despite a modest sacrifice in monetary standards of living.

Environmental education must therefore continue to emphasize the connection between “quality of life” and a clean environment, with access to a healthy natural world. While a credible case can be made in economic terms for public policies, it is wrong to define happiness and national well-being along strict economic lines. Expanded GNP often does not reflect expanded total utility and invariably ignores substantial unaccounted losses of the earth’s natural resources.

VI. Conclusion

Israel has proven during its brief history that it is capable of making remarkable achievements in environmentally-related fields. It leads the world in areas such as waste water reuse and in solar heating of water. It may be the only country

in the world where the desert is clearly in retreat and arid land reclamation has succeeded on a macro-level (Ministry of Environment, 1992). Yet, for a variety of reasons, for too long most pollution problems have "sat on the back burner" and today have reached a critical stage where irreversible damage is beginning to emerge. Environmental indicators across virtually all media are negative: the air, water and land are degrading rapidly and the unique landscape of the Holyland is spoiled by sprawl and unimaginative development.

With the advent of peace, the environmental challenges will only grow. A recent independent catalogue of proposed regional development projects likely to impact Israel's environment reached a full 53 pages (Ecopeace, 1992). Greater societal resources must focus on reducing pollution and more must be asked in revising the ecologically unfriendly lifestyles of Israeli citizens who are living in the Western world's crowded country.

As a country founded on an ideology of land reclamation, it is imperative that the State of Israel integrate modern principles of sustainability across the board in its government policies. Linear development and production patterns have left a land suffocating in the residuals. A cyclical approach to production and waste management that perceives the land, air and water as fragile and very limited resources is in fact consonant with traditional Jewish values. Israeli society meticulously preserves and nurtures the holy sites which it holds in trust for four of the world's major faiths and the generations ahead. A commitment of similar magnitude, along with true ingenuity, will be required to keep the Holyland whole.

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